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AUTHORITY

AFAPL ltr, 12 Apr 1972

AFAPL-TR-70-10
VOLUME II

EVALUATION STUDY OF THE OXIDATION-CORROSION CHARACTERISTICS OF AIRCRAFT TURBINE ENGINE LUBRICANTS

J. P. Cuellar
B. B. Baber

Southwest Research Institute

TECHNICAL REPORT AFAPL-TR-70-10, VOLUME II

May 1970

Air Force Aero Propulsion Laboratory
Air Force Systems Command
Wright-Patterson Air Force Base, Ohio

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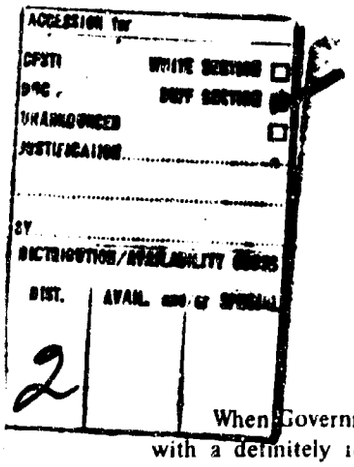

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FOREWORD

This report was prepared by Southwest Research Institute, 8500 Culebra Road, San Antonio, Texas, under Contract F33615-69-C-1295, Project No. 3048. The work was administered by the Lubrication Branch, Air Force Aero Propulsion Laboratory (AFAPL), Air Force Systems Command, Wright-Patterson Air Force Base, Ohio. The project engineers were Messrs. G. A. Beane, L. J. DeBrohun, and H. A. Smith (APFL).

This report covers one phase of work performed under the subject contract. This report was submitted by the authors in January 1970.

This technical report has been reviewed and is approved.

H. F. JONES
Chief, Lubrication Branch,
Fuel, Lubrication, and
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Laboratory

ABSTRACT

Volume II of this report contains a compilation of the individual test data sheets for all tests reported in Volume I. The data sheets are presented in the order of test number.

TEST NO. 127-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-60-8 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No, mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.12		4.20	0.18	–			
16 hr	18.89	17.2	4.80	0.45	42.1			
24 hr	21.74	34.9	5.34	0.59	63.0			
40 hr	41.29	156	8.71	1.13	96.6			
48 hr	79.03	390	14.29	1.67	101.3	60	1.14	9.66

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	+0.04
Ag	+0.06
Steel	+0.08
Cu	−0.08
Mg	+0.02

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Brown
Ag	L yellow
Steel	Blue-green
Cu	L pink
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	(a)
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Insufficient sample.

TEST NO. 127-2. RESULTS OF NONREFLUX OXIDATION CORROSION TEST ON O-60-18 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	12.13		3.17	0.19				
16 hr	13.47	11.0	3.48	0.65	31.2			
24 hr	13.72	13.1	3.52	0.72	46.5			
40 hr	14.52	19.7	3.63	0.93	73.8			
48 hr	15.19	25.2	3.65	1.10	85.0	50	2.33	11.21

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.22
Ti	+0.22
Ag	+0.24
Steel	+0.28
Cu	+0.22
Mg	+0.26

Metal discoloration, deposits, pitting, or etching:

Al	M carbon
Ti	M carbon
Ag	M carbon
Steel	M carbon
Cu	M carbon
Mg	M carbon

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	4.0
Tube deposits:	Below oil level	L carbon
	At and above oil level	L carbon

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 127-3. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-61-11 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.67		4.11	0.39				
16 hr	17.38	10.9	4.47	0.91	35.2			
24 hr	18.50	18.1	4.75	0.91	51.2			
40 hr	22.93	46.3	5.70	0.91	78.7			
48 hr	29.59	88.4	7.09	1.17	88.8	60	2.29	10 98

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.08
Ti	+0.02
Ag	+0.02
Steel	+0.47
Cu	+0.26
Mg	+0.12

Metal discoloration, deposits, pitting, or etching:

Al	L brown
Ti	L green
Ag	Brown
Steel	L green
Cu	L carbon
Mg	L carbon

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 127-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-62-3 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.51		3.84	0.02				
16 hr	17.46	12.6	4.15	0.58	18.6			
24 hr	18.95	22.2	4.40	0.67	32.5			
40 hr	23.40	50.9	5.42	0.94	52.9			
48 hr	26.72	72.3	5.64	1.21	57.6	42	1.62	9.09

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	+0.02
Ag	0.00
Steel	+0.02
Cu	−0.18
Mg	+0.04

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Brown
Ag	L yellow
Steel	Blue
Cu	Brown
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 127-5. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-62-4 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.01		3.93	0.11	–			
16 hr	16.46	9.7	4.26	0.84	34.2			
24 hr	17.33	15.5	4.45	0.90	50.5			
40 hr	21.78	45.1	5.43	1.26	81.1			
48 hr	32.04	113	7.63	1.95	92.5	55	1.69	10.98

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.04
	Ti	+0.02
	Ag	+0.06
	Steel	+0.06
	Cu	−0.02
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	L pink
	Ti	Tan
	Ag	L pink
	Steel	Green
	Cu	Orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	(a)
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Insufficient sample.

TEST NO. 127-6. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-62-6 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	17.79		4.70	0.24				
16 hr	17.99	1.1	5.07	0.75	33.6			
24 hr	21.12	18.7	5.42	0.82	49.2			
40 hr	26.21	47.3	6.49	1.25	78.3			
48 hr	38.79	118	7.43	22.4	82.9	57	2.68	10.67

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.04
	Ti	+0.02
	Ag	0.00
	Steel	+0.02
	Cu	−0.25
	Mg	+0.10
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Blue
	Ag	No change
	Steel	L green
	Cu	L etching
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 137-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TFST ON O-62-13 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.00	–	4.24	0.25	--			
16 hr	17.80	11.2	4.60	0.76	38.2			
24 hr	19.24	20.2	4.94	0.79	54.7			
40 hr	25.36	58.5	6.25	1.10	83.8			
48 hr	38.97	144	9.11	1.54	93.0	57	1.91	10.83

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.02
Ag	−0.02
Steel	0.00
Cu	−0.16
Mg	+0.04

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L blue
Ag	Tan
Steel	Blue
Cu	Gold
Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 137-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-62-16 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.84	–	4.45	0.22	–			
16 hr	18.82	11.8	4.85	0.76	38.0			
24 hr	20.31	20.6	5.18	0.82	53.9			
40 hr	25.69	52.6	6.31	1.10	82.8			
48 hr	28.58	69.7	6.11	13.96	94.8	57	1.37	10.60

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.02
Ag	−0.02
Steel	+0.04
Cu	−0.16
Mg	+0.08

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L blue
Ag	L yellow
Steel	Blue
Cu	Gold
Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 137-3. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-63-8 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	13.77	–	3.50	0.15	–			
16 hr	14.79	7.4	3.65	0.43	21.2			
24 hr	15.14	9.9	3.72	0.51	30.4			
40 hr	15.99	16.1	3.86	0.59	47.0			
48 hr	16.49	19.8	4.01	0.50	54.0	35	1.71	11.42

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	+0.04
Ag	−0.04
Steel	−0.04
Cu	−0.62
Mg	−0.12

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Tan
Ag	L yellow
Steel	Blue
Cu	H pitting
Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	0.2
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 137-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-63-16 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.47	–	4.34	0.29	–			
16 hr	19.01	15.4	4.92	0.65	37.7			
24 hr	21.30	29.3	5.36	0.65	54.3			
40 hr	30.09	82.7	7.26	0.93	81.6			
48 hr	44.47	170	10.24	1.14	89.1	56	1.75	9.90

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	0.00
Ag	0.00
Steel	−0.02
Cu	−0.02
Mg	+0.08

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Blue
Ag	No change
Steel	Yellow
Cu	L brown
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	I var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 137-5. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-64-18 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.84	--	4.29	0.11	--			
16 hr	18.31	8.7	4.56	0.86	22.8			
24 hr	18.80	11.6	4.69	0.96	31.7			
40 hr	20.20	20.0	4.96	1.45	47.9			
48 hr	21.42	27.2	5.22	1.69	55.0	36	3.11	11.21

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	0.00
Steel	0.00
Cu	−0.10
Mg	−0.02

Metal discoloration, deposits, pitting, or etching:

Al	Gray
Ti	Blue
Ag	No change
Steel	Blue-green
Cu	L brown
Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 143-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-61-11 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.67	--	4.11	0.39	--			
16 hr	17.54	11.9	4.50	0.87	38.0			
24 hr	18.85	20.3	4.80	0.89	55.1			
40 hr	24.34	55.3	5.99	0.89	82.0			
48 hr	34.21	118	8.19	1.38	90.5	54	2.03	11.08

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.04
Ti	+0.06
Ag	+0.24
Steel	+0.02
Cu	+0.26
Mg	+0.12

Metal discoloration, deposits, pitting, or etching:

Al	L brown
Ti	L green
Ag	Brown
Steel	Green-red
Cu	L carbon
Mg	Brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 143-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-62-4 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.01	–	3.93	0.11	–			
16 hr	16.48	9.8	4.24	0.88	34.9			
24 hr	17.41	16.0	4.47	0.82	51.9			
40 hr	21.73	44.8	4.52	0.99	84.1			
48 hr	30.22	101	7.36	1.45	96.6	58	1.68	11.06

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	+0.02
	Ag	+0.04
	Steel	+0.06
	Cu	-0.04
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	Pink
	Ti	Pink
	Ag	L pink
	Steel	Green
	Cu	Orange
	Mg	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	(a)
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Insufficient sample.

TEST NO. 143-3. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-62-6 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	17.79	–	4.70	0.24	–			
16 hr	20.02	12.5	5.15	0.86	36.6			
24 hr	21.89	23.0	5.57	0.84	53.5			
40 hr	28.96	62.8	7.19	1.18	83.1			
48 hr	40.68	129	9.59	1.78	93.0	58	2.02	11.01

Metal Specimen Data

Weight change, mg/cm²:	Al	-0.02
	Ti	-0.02
	Ag	+0.06
	Steel	0.00
	Cu	-0.10
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	L pink
	Ti	Purple
	Ag	No change
	Steel	Green
	Cu	L yellow
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 143-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-64-12 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	13.79	–	3.52	0.25	–			
16 hr	14.71	6.7	3.70	0.88	16.0			
24 hr	15.39	11.6	3.98	0.86	22.9			
40 hr	15.95	15.7	4.04	1.11	35.5			
48 hr	15.78	14.4	3.86	1.27	41.0	31	2.85	11.95

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.26
Ti	+0.36
Ag	+0.24
Steel	+0.28
Cu	−0.16
Mg	+0.30

Metal discoloration, deposits, pitting, or etching:

Al	L carbon
Ti	L carbon
Ag	L carbon
Steel	L carbon
Cu	M carbon
Mg	L carbon

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	1.6
Tube deposits:	Below oil level	L carbon
	At and above oil level	L carbon

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 143-6. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-64-2 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	27.50	–	5.08	0.07	–			
16 hr	29.54	7.4	5.35	0.19	4.5			
24 hr	30.64	11.4	5.45	0.25	6.1			
40 hr	31.48	14.5	5.61	0.33	8.9			
48 hr	32.65	18.7	5.72	0.38	10.1	15	3.33	21.54

Metal Specimen Data

Weight change, mg/cm²:

Al	−0.06
Ti	0.00
Ag	+0.06
Steel	+0.04
Cu	−0.10
Mg	+0.02

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Tan
Ag	L yellow
Steel	Blue
Cu	Purple
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 149-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-64-21 AT 425°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.56	–	3.55	0.07				
18 hr	21.23	36.4	4.32	3.93	42.3	24	14.23	13.86

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.06
Ag	+0.02
Steel	+0.02
S. S.	+0.06

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L tan
Ag	L yellow
Steel	Blue
S. S.	L brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	425
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 149-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-64-22 AT 425°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	18.28	–	4.09	0.17				
18 hr	19.46	6.5	4.28	0.57	38.9	22	6.09	14.87

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.04
Ag	−0.04
Steel	+0.04
S. S.	+0.08

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Tan
Ag	L yellow
Steel	Blue
S. S.	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	Non-
	At and above oil level	None

Test Conditions

Sample temperature, °F	425
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 150-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-64-21 AT 450°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.56	–	3.55	0.07				
18 hr	806.7	5080	44.48	15.10	119.4	68	68.6	10.36

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	−0.12
Steel	+0.02
S. S.	+0.02

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L tan
Ag	L yellow
Steel	Blue-green
S. S.	L brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	450
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 150-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-64-22 AT 450°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample Acidity, mg KOH/g	Overhead Sample Vis, cs/100°F
Initial	18.28	–	4.09	0.17				
18 hr	244.0	1235	20.46	9.99	112.9	65	61.3	10.84

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	0.00
Steel	+0.08
S. S.	+0.02

Metal discoloration, deposits, pitting, or etching:

Al	Nc change
Ti	L tan
Ag	Brown
Steel	Blue-green
S. S.	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	450
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 163-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-62-3 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.51	–	3.84	0.02	
[illegible] hr	17.61	13.5	4.18	0.58	
[illegible] hr	19.15	24.0	4.45	0.63	
[illegible]	23.57	51.9	5.14	0.91	
[illegible]	26.83	73.0	5.65	1.12	43

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.02
Ag	+0.02
Steel	+0.04
Cu	–0.14
Mg	+0.04

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Brown
Ag	Yellow
Steel	Blue
Cu	Blue-brown
Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 163-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-62-6 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.79	–	4.70	0.24	
16 hr	19.65	10.5	5.08	0.79	
24 hr	21.26	19.5	5.43	0.82	
40 hr	26.77	50.5	6.63	1.13	
48 hr	26.53	49.1	5.91	10.78	54

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	0.00
Steel	+0.02
Cu	−0.20
Mg	+0.04

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Blue-green
Ag	L yellow
Steel	Peacock
Cu	Yellow-orange
Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 163-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-62-16 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.84	–	4.45	0.22	
16 hr	18.54	10.1	4.78	0.80	
24 hr	19.83	17.8	5.07	0.81	
40 hr	23.89	41.9	6.01	1.20	
48 hr	35.35	110	6.94	21.9	57

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	−0.10
Steel	+0.02
Cu	−0.59
Mg	+0.04

Metal discoloration, deposits, pitting, or etching:

Al	L blue
Ti	Blue-green
Ag	No change
Steel	Blue-green
Cu	M pitting
Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 163-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-63-16 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.47	–	4.34	0.29	
16 hr	18.65	13.2	4.80	0.62	
24 hr	20.73	25.9	5.24	0.67	
40 hr	28.84	75.1	6.98	0.84	
48 hr	41.65	153	9.67	1.17	55

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	−0.02
	Steel	0.00
	Cu	−0.04
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Blue-red
	Ag	No change
	Steel	Blue-green
	Cu	L brown
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 164-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-62-4 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.01	–	3.93	0.39	
16 hr	16.43	9.5	4.24	0.86	
24 hr	17.29	15.2	4.37	0.86	
40 hr	20.80	38.6	5.23	0.91	
48 hr	26.93	79.4	6.56	1.14	54

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.04
	Ti	0.00
	Ag	+0.02
	Steel	0.00
	Cu	−0.04
	Mg	+0.04
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L brown
	Ag	L yellow
	Steel	Green-blue
	Cu	Brown
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	M var
	At and above oil level	L carbon

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 164-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-62-6 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.79	–	4.70	0.24	
16 hr	19.74	11.0	5.10	0.87	
24 hr	21.36	20.1	5.46	0.88	
40 hr	27.25	53.2	6.77	1.09	
48 hr	28.11	58.0	6.56	5.01	54

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	0.00
	Steel	0.00
	Cu	−0.12
	Mg	+0.04
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L red-blue
	Ag	L yellow
	Steel	Blue
	Cu	Yellow-brown
	Mg	L yellow-green

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	L carbon

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 164-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-2 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	27.50		5.08	0.07	
16 hr	29.92	8.8	5.36	0.21	
24 hr	30.72	11.7	5.45	0.24	
40 hr	31.85	15.8	5.68	0.30	
48 hr	32.59	18.5	5.70	0.31	16

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.04
	Ti	0.00
	Ag	+0.02
	Steel	−0.04
	Cu	−0.06
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	L yellow
	Steel	Blue
	Cu	Purple
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 165-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-62-6 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	17.79		4.70	0.24				
16 hr	19.97	12.3	5.15	0.74	37.0			
24 hr	21.76	22.3	5.58	0.79	54.0			
40 hr	29.28	64.6	7.19	1.19	84.0			
48 hr	38.89	119	9.12	2.06	94.0	57	2.41	10.94

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.04
Ti	−0.02
Ag	+0.06
Steel	0.00
Cu	−0.14
Mg	−0.04

Metal discoloration, deposits, pitting, or etching:

Al	L purple
Ti	Dark purple
Ag	Tan
Steel	Blue-green
Cu	Yellow-green
Mg	L yellow-green

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 166-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-62-3 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.51	–	3.84	0.02	
16 hr	17.54	13.1	4.16	0.53	
24 hr	18.91	21.9	4.32	0.65	
40 hr	23.26	50.0	5.10	0.91	
48 hr	26.15	68.6	5.59	1.08	43

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.10
Ti	+0.10
Ag	0.00
Steel	+0.02
Cu	0.00
Mg	+0.06

Metal discoloration, deposits, pitting, or etching:

Al	L brown
Ti	Brown
Ag	Yellow
Steel	Blue
Cu	Purple
Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 167-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-26 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.77	–	3.10	0.33	
16 hr	16.38	28.3	3.63	0.26	
24 hr	18 28	43.1	3.90	0.26	
40 hr	22.76	78.2	4.47	0.34	
48 hr	26.32	106	4.92	0.47	52

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.06
	Ti	0.00
	Ag	-0.02
	Steel	-0.04
	Cu	-0.35
	Mg	+0.06
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L tan
	Ag	L yellow
	Steel	Yellow-brown
	Cu	L pitting
	Mg	Yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 168-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-64-26 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	12.77	–	3.10	0.33	–			
16 hr	16.33	27.9	3.62	0.24	49.6			
24 hr	18.21	42.6	3.88	0.29	65.7			
40 hr	22.74	78.1	4.48	0.36	86.7			
48 hr	26.70	109	4.97	0.41	92.3	54	1.37	9.39

Metal Specimen Data

		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	0.00	-0.06
	Ti	0.00	-0.02
	Ag	-0.06	-0.06
	Steel	0.00	-0.02
	Cu	-0.28	-0.36
	Mg	+0.20	+0.06
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	
	Ti	L tan	
	Ag	L yellow	
	Steel	Brown-yellow	
	Cu	Brown	
	Mg	Yellow	

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 181-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-14 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	17.71	–	4.67	0.24	–			
16 hr	19.57	10.5	5.08	0.70	39.1			
24 hr	21.41	20.9	5.47	0.88	56.8			
40 hr	23.07	30.3	5.29	10.12	88.2			
48 hr	119.9	577	16.04	28.9	101.7	60	5.55	10.64

Metal Specimen Data

Weight change, mg/cm²:

Al	−0.18
Ti	−0.12
Ag	−0.08
Steel	+0.02
Cu	−0.10
Mg	−0.16

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Blue-green
Ag	L yellow
Steel	Peacock
Cu	L brown
Mg	L pitting

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	(a)
Tube deposits:	Below oil level	M var
	At and above oil level	M var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 181-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-14 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.71	–	4.67	0.24	
16 hr	19.40	9.5	5.01	0.66	
24 hr	20.88	17.9	5.36	0.84	
40 hr	23.05	30.2	5.15	13.19	
48 hr	97.83	452	14.01	30.7	58

Metal Specimen Data

Weight change, mg/cm²:

Al	−0.10
Ti	−0.08
Ag	−0.04
Steel	+0.02
Cu	−0.04
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Blue-green
Ag	L yellow
Steel	Peacock
Cu	L brown
Mg	L brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	(a)
Tube deposits:	Below oil level	M var
	At and above oil level	M var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

(a) Insufficient sample.

TEST NO. 183-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-18 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/160°F
Initial	17.55		4.61	0.21				
16 hr	19.68	12.1	5.06	0.72	38.6			
24 hr	21.59	23.0	5.50	0.81	55.2			
40 hr	29.19	66.3	7.10	1.23	83.0			
48 hr	43.59	148	10.06	1.85	92.2	59	1.87	10.91

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.02
Ag	0.00
Steel	0.00
Cu	−0.12
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Brown
Ag	L yellow
Steel	Blue
Cu	Brown & green
Mg	Yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	H var
	At and above oil level	H var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 183-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-18 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.55		4.61	0.21	
16 hr	19.31	10.0	4.96	0.72	
24 hr	20.92	19.2	5.33	0.79	
40 hr	27.67	57.7	6.79	1.10	
48 hr	40.21	129	9.40	1.68	54

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	-0.02
Steel	0.00
Cu	-0.08
Mg	+0.10

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Brown
Ag	L yellow
Steel	Blue
Cu	L green & yellow
Mg	Yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 183-3. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-19 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	17.72	--	4.57	0.25	--			
16 hr	17.49	−1.3	4.15	0.57	37.7			
24 hr	19.19	+8.3	4.44	0.72	52.3			
40 hr	24.38	+37.6	5.29	1.02	72.2			
48 hr	28.15	+58.9	5.85	1.29	76.3	45	1.68	9.18

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	−0.04
Steel	0.00
Cu	−0.18
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Brown
Ag	L yellow
Steel	Blue
Cu	Brown & green
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 183-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-19 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.72	–	4.67	0.25	
16 hr	19.09	7.7	4.91	0.71	
24 hr	20.45	15.4	5.25	0.82	
40 hr	25.52	44.0	6.32	1.08	
48 hr	26.21	47.9	5.82	10.49	

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	−0.02
Steel	0.00
Cu	−0.12
Mg	+0.08

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Brown & blue
Ag	L yellow
Steel	Blue
Cu	L green & yellow
Mg	Yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 183-5. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-21 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.11	–	3.76	0.07	–			
16 hr	17.34	14.8	4.13	0.63	35.2			
24 hr	18.92	25.2	4.39	0.73	48.9			
40 hr	23.48	55.4	5.13	0.96	68.5			
48 hr	26.54	75.6	5.62	1.25	73.1	45	1.82	9.12

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	−0.04
	Steel	0.00
	Cu	−0.16
	Mg	−0.04
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown
	Ag	L yellow
	Steel	Blue
	Cu	Brown & green
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 183-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-21 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.11	–	3.76	0.07	
16 hr	19.08	26.3	4.93	0.76	
24 hr	20.36	34.7	5.22	0.82	
40 hr	24.48	62.0	6.06	1.21	
48 hr	41.36	174	7.61	26.4	54

Metal Specimen Data

Weight change, mg/cm² :	Al	0.00
	Ti	−0.02
	Ag	−0.06
	Steel	0.00
	Cu	−0.27
	Mg	−0.73
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown & blue
	Ag	L yellow
	Steel	Blue
	Cu	Orange
	Mg	Yellow & pitted

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	H var
	At and above oil level	H var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 188-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-64-25 AT 425°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	28.76	–	5.36	0.00				
18 hr	33.21	15.5	5.87	1.05	17.4	11	6.81	19.57

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	0.00
	Ag	+0.02
	Steel	+0.04
	S. S.	−0.02
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Tan
	Ag	L yellow
	Steel	Blue
	S. S.	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	425
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 188-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-15 AT 425°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	27.20	–	5.04	0.02				
18 hr	32.32	18.8	5.59	0.81	20.1	17	6.15	21.34

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	0.00
	Ag	−0.02
	Steel	0.00
	S. S.	−0.04
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Tan
	Ag	L yellow
	Steel	Blue
	S. S.	L brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	425
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 188-3. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-16 AT 425°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	26.69	–	5.13	0.20				
18 hr	59.32	122	8.35	6.80	30.9	20	83.1	11.17

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	0.00
	Ag	−0.10
	Steel	0.00
	S. S.	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Tan
	Ag	L yellow
	Steel	Blue
	S. S.	L brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	425
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 189-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-64-25 AT 450°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	28.76	–	5.36	0.00				
18 hr	805.2	2700	42.81	8.38	83.5	50	122.5	9.45

Metal Specimen Data

Weight change, mg/cm²:

Al	−0.02
Ti	−0.06
Ag	−0.24
Steel	+0.08
S. S.	−0.06

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L tan
Ag	L yellow
Steel	Brown
S. S.	Tan-green

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	450
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 189-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-15 AT 450°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	27 20	–	5.04	0.02				
18 hr	223.6	722	18.82	8.80	63.0	38	90.6	11.78

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.02
Ag	−0.12
Steel	+0.02
S. S.	0.00

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Tan
Ag	L tan
Steel	Blue
S. S.	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	450
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 191-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-23 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.62	–	3.15	0.20	
16 hr	17.02	34.9	3.85	0.32	
24 hr	20.18	59.9	4.28	0.56	
40 hr	27.72	120	5.25	0.85	
48 hr	31.24	148	5.70	0.86	50

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	0.00
	Steel	0.00
	Cu	−0.04
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	L yellow
	Steel	Peacock
	Cu	Orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 191-3. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-23 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	12.62	–	3.15	0.20	–			
16 hr	17.34	37.4	3.87	0.32	53.0			
24 hr	20.50	62.4	4.31	0.56	68.5			
40 hr	27.44	117	5.21	0.81	79.4			
48 hr	30.46	141	5.57	0.84	80.1	52	1.13	7.90

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.04
	Ag	0.00
	Steel	0.00
	Cu	−0.02
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	L yellow
	Steel	Peacock
	Cu	Orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 192-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-31 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.40	–	3.23	0.08	
16 hr	15.31	14.3	3.53	0.22	
24 hr	16.36	22.1	3.68	0.36	
40 hr	19.06	42.2	4.07	0.61	
48 hr	21.12	57.6	4.35	0.65	44

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	0.00
	Steel	+0.02
	Cu	+0.02
	Mg	+0.04
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L yellow
	Steel	Blue-brown
	Cu	Orange
	Mg	L gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 192-6. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-31 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	13.40	–	3.23	0.08	–			
16 hr	15.37	14.7	3.54	0.22	34.1			
24 hr	16.42	22.5	3.68	0.36	47.3			
40 hr	19.25	43.7	4.10	0.61	66.5			
48 hr	21.30	59.0	4.39	0.65	72.0	43	1.23	10.25

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	+0.04
	Mg	+0.12
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L yellow
	Steel	Blue-brown
	Cu	Orange
	Mg	L gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 195-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-6 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.74	–	3.65	0.18	
16 hr	15.56	5.6	3.82	0.81	
24 hr	15.94	8.1	3.88	0.96	
40 hr	17.54	19.0	4.16	2.61	
48 hr	19.24	30.5	4.45	3.28	34

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	-0.02
Ag	-0.39
Steel	0.00
Cu	-22.9
Mg	+0.49

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	L pitting
Steel	Brown
Cu	H etching
Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 195-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-22 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.18	–	3.72	0.00	
16 hr	15.93	4.9	3.84	0.26	
24 hr	16.22	6.9	3.90	0.53	
40 hr	16.96	11.7	4.00	1.08	
48 hr	17.46	15.0	4.08	1.21	27

Metal Specimen Data

Weight change, mg/cm²:

Al	-0.02
Ti	0.00
Ag	0.00
Steel	0.00
Cu	-0.08
Mg	+0.26

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	No change
Steel	Blue
Cu	Orange
Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 195-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-35 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.09	–	3.21	0.19	
16 hr	18.49	41.3	4.04	0.42	
24 hr	21.01	60.5	4.40	0.65	
40 hr	25.08	91.6	4.88	0.81	
48 hr	26.83	105	5.10	0.91	44

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	-0.02
	Ag	-0.02
	Steel	+0.02
	Cu	-0.02
	Mg	+0.22
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	No change
	Steel	Blue-green
	Cu	Gold
	Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 195-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-64-6 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	14.74	–	3.65	0.18	–			
16 hr	15.59	5.8	3.86	0.77	15.5			
24 hr	15.96	8.3	3.89	0.95	22.6			
40 hr	17.64	26.5	4.17	2.68	37.3			
48 hr	19.31	31.0	4.46	3.20	43.7	35	8.98	12.63

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	-0.40
	Steel	0.00
	Cu	-21.8
	Mg	+0.51
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L pitting
	Steel	Brown
	Cu	H etching
	Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 195-5. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-22 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.18	–	3.72	0.00	–			
16 hr	15.93	4.9	3.84	0.27	15.7			
24 hr	16.23	6.9	3.90	0.56	22.7			
40 hr	16.98	11.9	4.00	1.12	36.2			
48 hr	17.48	15.2	4.08	1.23	41.9	27	2.95	12.70

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.06
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−0.04
	Mg	+0.16
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	No change
	Steel	Blue-green
	Cu	Orange
	Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 195-6. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-35 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	13.09	–	3.21	0.19	–			
16 hr	18.63	42.3	4.05	0.45	48.7			
24 hr	20.96	60.1	4.36	0.68	59.9			
40 hr	25.25	92.9	4.89	0.85	67.9			
48 hr	27.22	108	5.12	0.92	68.9	44	1.40	7.51

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	0.00
	Ag	−0.04
	Steel	+0.06
	Cu	−0.08
	Mg	+0.36
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	No change
	Steel	Blue-green
	Cu	Gold
	Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 196-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-36 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	28.33	–	5.31	0.14	
16 hr	30.34	7.1	5.60	0.21	
24 hr	31.15	10.0	5.69	0.32	
40 hr	32.44	14.5	5.85	0.42	
48 hr	33.21	17.2	5.96	0.50	11

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	0.00
Steel	0.00
Cu	-0.08
Mg	+0.81

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L tan
Ag	No change
Steel	Blue
Cu	Orange-green
Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 196-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-38 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.31	–	3.53	0.11	
16 hr	16.08	12.4	3.82	0.10	
24 hr	17.42	21.7	4.06	0.11	
40 hr	21.20	48.1	4.64	0.18	
48 hr	23.72	65.8	4.99	0.23	46

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	-0.02
Steel	0.00
Cu	-0.12
Mg	+0.75

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L tan
Ag	No change
Steel	Blue
Cu	Orange-green
Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 196-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-40 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.76	–	3.29	0.06	
16 hr	15.97	16.1	3.66	0.24	
24 hr	17.14	24.6	3.84	0.42	
40 hr	20.17	46.6	4.24	0.59	
48 hr	22.13	60.8	4.52	0.75	43

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	+0.04
	Mg	+0.39
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	No change
	Steel	Blue
	Cu	Orange-green
	Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 196-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-36 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	28.33	–	5.31	0.14	–			
16 hr	30.33	7.1	5.59	0.21	1.8			
24 hr	31.15	10.0	5.69	0.31	2.7			
40 hr	32.55	14.9	5.87	0.43	4.3			
48 hr	33.36	17.8	5.99	0.45	4.9	12	3.53	19.63

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	0.00
	Steel	0.00
	Cu	−0.04
	Mg	+0.59
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	No change
	Steel	Blue
	Cu	Orange-green
	Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	13[illegible]
Condensate return	No

TEST NO. 196-5. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-38 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	14.31	–	3.53	0.11	–			
16 hr	16.21	13.3	3.84	0.10	47.2			
24 hr	17.62	23.1	4.08	0.11	52.0			
40 hr	21.74	51.9	4.72	0.18	72.7			
48 hr	24.60	71.9	5.14	0.20	77.3	46	0.70	9.53

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	−0.04
Steel	−0.02
Cu	−0.06
Mg	+0.61

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L tan
Ag	No change
Steel	Blue
Cu	Orange-green
Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 196-6. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-40 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	13.76	–	3.29	0.06	–			
16 hr	15.98	16.1	3.66	0.25	33.2			
24 hr	17.24	25.3	3.85	0.38	45.9			
40 hr	20.35	47.9	4.29	0.61	63.9			
48 hr	22.64	64.5	4.58	0.67	68.4	43	1.21	9.97

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	−0.02
Steel	0.00
Cu	+0.10
Mg	+0.51

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L tan
Ag	No change
Steel	Blue-green
Cu	Dark gold
Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 197-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-684[a] AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.1	–	4.13	0.15	
16 hr	18.18	12.5	4.49	0.61	
24 hr	19.74	22.2	4.80	0.68	
40 hr	25.48	57.7	5.80	1.12	
48 hr	31.63	95.7	6.84	1.50	51

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	0.00
	Steel	0.00
	Cu	−0.16
	Mg	+0.16
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown
	Ag	Yellow
	Steel	Blue
	Cu	Yellow-green
	Mg	L tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

(a) Blend (1:1) of O-65-18 and O-65-21.

TEST NO. 197-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON ATL-584[a] AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.16	–	4.13	0.15	-			
16 hr	18.25	12.9	4.51	0.64	36.4			
24 hr	20.07	24.2	4.84	0.71	51.1			
40 hr	26.10	61.5	5.93	1.11	75.3			
48 hr	32.05	98.3	6.92	1.49	80.8	54	1.82	10.06

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−0.14
	Mg	+0.08
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown
	Ag	Yellow
	Steel	Blue
	Cu	Yellow-green
	Mg	L tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (1:1) of O-65-18 and O-65-21.

TEST NO. 199-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1115[a] AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.29	–	4.18	0.17	–			
16 hr	18.32	12.5	4.53	0.63	35.8			
24 hr	20.12	23.5	4.68	0.73	51.3			
40 hr	26.36	61.8	5.99	1.17	72.5			
48 hr	33.51	106	7.22	1.48	76.6	53	1.77	10.04

Metal Specimen Data

Weight change, mg/cm²:

Al	−0.02
Ti	−0.02
Ag	0.00
Steel	−0.02
Cu	−0.12
Mg	+0.08

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	Tan
Steel	L blue
Cu	L brown
Mg	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (1:1) of O-65-19 and O-65-21.

TEST NO. 199-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1116[a] AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.66	–	3.96	0.12	–			
16 hr	17.92	14.4	4.35	0.58	38.3			
24 hr	19.66	25.5	4.65	0.67	54.6			
40 hr	24.95	59.3	5.52	1.00	77.6			
48 hr	29.21	86.5	6.22	1.34	83.6	50	1.69	9.57

Metal Specimen Data

Weight change, mg/cm²:

Al	−0.04
Ti	−0.04
Ag	−0.02
Steel	−0.02
Cu	−0.08
Mg	+0.06

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	Tan
Steel	L blue
Cu	L brown
Mg	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (1:3) of O-65-19 and O-65-21.

TEST NO. 199-3. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1117[a] AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.97	–	4.40	0.20	–			
16 hr	18.74	10.4	4.72	0.68	37.2			
24 hr	20.36	20.0	5.05	0.77	54.2			
40 hr	25.90	52.6	6.10	1.32	81.7			
48 hr	33.01	94.5	7.50	1.67	91.0	54	2.00	10.46

Metal Specimen Data

Weight change, mg/cm²:

Al	−0.04
Ti	−0.06
Ag	0.00
Steel	−0.04
Cu	−0.12
Mg	+0.10

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L blue
Ag	Tan
Steel	L blue
Cu	L brown
Mg	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (3:1) of O-65-19 and O-65-21.

TEST NO. 199-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1118[a] AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.28	-	3.84	0.09				
16 hr	17.84	16.8	4.25	0.56	38.2			
24 hr	19.78	29.5	4.58	0.66	53.4			
40 hr	25.10	64.3	5.46	1.04	71.5			
48 hr	28.96	89.5	6.10	1.23	74.7	50	1.63	9.39

Metal Specimen Data

Weight change, mg/cm²:

Al	−0.04
Ti	−0.08
Ag	−0.02
Steel	−0.04
Cu	−0.08
Mg	+0.08

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	Tan
Steel	L blue
Cu	L brown
Mg	L gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (1:9) of O-65-19 and O-65-21.

TEST NO. 199-5. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1119[a] AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	17.41	–	4.55	0.23	–			
16 hr	19.14	9.9	4.90	0.67	38.6			
24 hr	20.97	20.4	5.27	0.79	55.8			
40 hr	27.82	59.8	6.65	1.34	84.6			
48 hr	40.12	130	9.10	2.00	93.5	55	2.02	10.70

Metal Specimen Data

Weight change, mg/cm²:

Al	−0.06
Ti	−0.03
Ag	−0.04
Steel	−0.02
Cu	−0.16
Mg	+0.08

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Blue
Ag	Tan
Steel	L blue
Cu	L brown
Mg	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (9:1) of O-65-19 and O-65-21.

TEST NO. 200-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-19 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	17.72	–	4.67	0.25				
16 hr	19.62	10.7	5.04	0.69	36.8			
24 hr	21.63	22.1	5.49	0.75	53.6			
40 hr	29.80	68.2	7.24	1.20	80.0			
48 hr	47.24	167	10.94	1.91	87.6	58	1.84	10.87

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	+0.02
Steel	0.00
Cu	−0.08
Mg	+0.10

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Brown-purple
Ag	Yellow
Steel	Blue
Cu	Peacock
Mg	Yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 200-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-21 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.11	–	3.76	0.07	–			
16 hr	17.54	16.1	4.16	0.57	38.3			
24 hr	19.33	27.9	4.46	0.62	53.9			
40 hr	24.13	59.7	5.23	0.94	74.0			
48 hr	27.44	81.6	5.73	1.21	78.7	47	1.85	9.05

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	0.00
	Steel	0.00
	Cu	−0.12
	Mg	+0.08
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown-yellow
	Ag	Yellow
	Steel	Blue
	Cu	Brown-purple
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 200-3. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-60-18 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	12.13	–	3.17	0.11	–			
16 hr	13.56	11.8	3.45	0.68	32.4			
24 hr	13.90	14.6	3.47	0.68	46.3			
40 hr	14.92	23.0	3.58	0.91	71.3			
48 hr	15.16	25.0	3.76	0.98	82.1	50	2.36	11.11

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	0.00
	Ag	+0.02
	Steel	+0.02
	Cu	+0.14
	Mg	+0.10
Metal discoloration, deposits, pitting, or etching:	Al	L tan
	Ti	L tan
	Ag	Yellow
	Steel	Blue
	Cu	Dark brown
	Mg	L brown

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	4.0
Tube deposits:	Below oil level	L carbon
	At and above oil level	L carbon

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 200-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-60-18 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.13	–	3.17	0.11	
16 hr	13.58	12.0	3.46	0.67	
24 hr	13.98	15.3	3.55	0.68	
40 hr	14.96	23.3	3.63	0.91	
48 hr	15.89	31.0	3.86	1.00	2

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	0.00
Steel	+0.02
Cu	+0.16
Mg	+0.12

Metal discoloration, deposits, pitting, or etching:

Al	L tan
Ti	L tan
Ag	Yellow
Steel	Blue
Cu	D brown
Mg	L brown

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	2.8
Tube deposits:	Below oil level	L carbon
	At and above oil level	L carbon

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 201-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1126[a] AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.21	–	4.14	0.16	–			
16 hr	18.34	13.1	4.52	0.62	37.3			
24 hr	20.05	23.7	4.86	0.68	52.8			
40 hr	26.57	63.9	6.02	1.12	75.2			
48 hr	33.06	104	7.25	1.47	79.4	53	1.77	10.05

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	−0.02
Ag	−0.02
Steel	+0.04
Cu	−0.12
Mg	+0.08

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Tan
Ag	L tan
Steel	Blue
Cu	Gold
Mg	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (1:1) of O-65-18 and O-65-21.

TEST NO. 201-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1127[a] AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.62	–	3.95	0.12	–			
16 hr	17.91	14.7	4.33	0.61	38.6			
24 hr	19.63	25.7	4.64	0.66	54.9			
40 hr	24.92	59.5	5.54	0.98	78.7			
48 hr	29.18	86.8	6.29	1.31	84.7	49	1.71	9.53

Metal Specimen Data

Weight change, mg/cm²:

Al	-0.02
Ti	-0.04
Ag	-0.04
Steel	+0.02
Cu	-0.04
Mg	+0.04

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Tan
Ag	L tan
Steel	Blue
Cu	Gold
Mg	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (1:3) of O-65-18 and O-65-21.

TEST NO. 201-3. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1128[a] AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.86	–	4.37	0.20	–			
16 hr	18.64	10.6	4.69	0.65	37.0			
24 hr	20.15	19.5	5.00	0.71	53.8			
40 hr	24.45	45.0	5.74	1.93	82.7			
48 hr	56.00	232	9.28	18.64	96.2	60	4.46	10.16

Metal Specimen Data

Weight change, mg/cm²:

Al	-0.02
Ti	-0.06
Ag	-0.02
Steel	+0.02
Cu	-0.12
Mg	-0.20

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Blue
Ag	Tan
Steel	L green
Cu	Rose
Mg	L pitting

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (3:1) of O-65-18 and O-65-21.

TEST NO. 201-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1129[a] AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.31	–	3.84	0.09	–			
16 hr	17.86	16.7	4.28	0.58	38.8			
24 hr	19.79	29.3	4.60	0.66	53.8			
40 hr	25.35	65.6	5.50	0.98	73.1			
48 hr	29.40	92.0	6.13	1.29	76.2	51	1.60	9.41

Metal Specimen Data

Weight change, mg/cm²:

Al	-0.02
Ti	-0.06
Ag	-0.02
Steel	0.00
Cu	-0.08
Mg	+0.02

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Tan
Ag	L tan
Steel	Blue
Cu	Gold
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (1:9) of O-65-18 and O-65-21.

TEST NO. 201-5. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1130[a] AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	17.30	–	4.50	0.22	–			
16 hr	19.16	10.8	4.90	0.67	38.8			
24 hr	20.69	19.6	5.23	0.71	55.8			
40 hr	23.63	36.6	5.27	9.18	87.2			
48 hr	104.8	506	14.12	23.5	99.6	59	5.19	10.43

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	-0.06
Ag	-0.08
Steel	+0.02
Cu	-0.28
Mg	-1.42

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L blue
Ag	L tan
Steel	Blue
Cu	L etching
Mg	H pitting

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (9:1) of O-65-18 and O-65-21.

TEST NO. 201-6. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-18 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	17.55		4.61	0.21	–			
16 hr	19.31	10.0	4.98	0.73	36.5			
24 hr	20.97	19.5	5.35	0.75	53.1			
40 hr	27.92	59.1	6.80	1.12	83.4			
48 hr	31.61	80.1	6.60	14.44	95.5	56	2.64	10.85

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	-0.06
Ag	-0.04
Steel	0.00
Cu	-0.06
Mg	+0.14

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L blue
Ag	Tan
Steel	Blue
Cu	Gold
Mg	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 202-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-556 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.98		3.63	1.66	
16 hr	15.20	8.7	3.89	1.41	
24 hr	16.05	14.8	4.08	1.27	
40 hr	22.38	60.1	4.98	13.04	
48 hr	116.1	730	16.09	27.0	59

Metal Specimen Data

Weight change, mg/cm²:

Al	-0.04
Ti	-0.02
Ag	+0.02
Steel	0.00
Cu	-0.24
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Brown-purple
Ag	L yellow
Steel	Blue-green
Cu	L etching
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 202-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-561 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.43	–	3.77	0.75	
16 hr	15.77	9.3	4.03	0.82	
24 hr	16.78	16.3	4.24	0.99	
40 hr	96.90	572	13.31	35.6	
48 hr	Gelled	–	–	39.2	64

Metal Specimen Data

Weight change, mg/cm²:

Al	-0.02
Ti	-0.04
Ag	+0.04
Steel	0.00
Cu	-1.08
Mg	-0.02

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Brown-purple
Ag	L yellow
Steel	Blue-green
Cu	M etching
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	M var
	At and above oil level	M var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 202-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-18 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.55	–	4.61	0.21	
16 hr	19.12	8.9	4.93	0.67	
24 hr	20.66	17.7	5.28	0.73	
40 hr	24.84	41.5	6.11	1.47	
48 hr	57.39	227	9.56	28.0	57

Metal Specimen Data

Weight change, mg/cm²:

Al	-0.04
Ti	-0.02
Ag	0.00
Steel	+0.02
Cu	-0.20
Mg	-0.14

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Tan-purple
Ag	L yellow
Steel	Blue-green
Cu	Brown
Mg	Yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 202-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-18 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	17.55	–	4.61	0.21	–			
16 hr	19.56	11.5	5.03	0.65	38.8			
24 hr	21.56	22.8	5.48	0.73	56.1			
40 hr	30.35	72.9	7.37	1.14	85.3			
48 hr	48.68	177	11.10	1.66	94.1	59	1.72	10.89

Metal Specimen Data

Weight change, mg/cm²:

Al	−0.04
Ti	0.00
Ag	+0.04
Steel	0.00
Cu	−0.12
Mg	+0.10

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Brown
Ag	L yellow
Steel	Blue
Cu	Brown-green
Mg	Yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 203-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1115[a] AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.29		4.18	0.17				
16 hr	17.83	9.5	4.46	0.52	28.0			
24 hr	19.13	17.4	4.70	0.61	40.3			
40 hr	23.17	42.4	5.46	0.79	59.3			
48 hr	26.98	65.6	6.18	0.95	64.8	45	1.59	9.91

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	+0.06
Steel	+0.02
Cu	−0.10
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	L brown
Ag	Yellow
Steel	Blue
Cu	L yellow
Mg	Green-brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (1:1) of O-65-19 and O-65-21.

TEST NO. 203-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1116[a] AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.66	–	3.96	0.12	–			
16 hr	17.40	11.1	4.26	0.50	29.9			
24 hr	18.64	19.0	4.47	0.58	42.7			
40 hr	22.18	41.6	5.10	0.75	63.7			
48 hr	25.07	60.1	5.62	0.85	70.7	41	1.61	9.45

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	0.00
Ag	+0.08
Steel	+0.02
Cu	−0.12
Mg	+0.02

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	L brown
Ag	Yellow
Steel	Blue
Cu	Green-brown
Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (1:3) of O-65-19 and O-65-21.

TEST NO. 203-3. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1117[a] AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.97	–	4.40	0.20	–			
16 hr	18.24	7.5	4.66	0.56	28.6			
24 hr	19.37	14.1	4.86	0.63	41.9			
40 hr	22.94	35.2	5.58	0.80	65.7			
48 hr	26.58	56.6	6.30	0.93	75.1	44	1.72	10.27

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	+0.04
Steel	+0.02
Cu	−0.14
Mg	+0.04

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	L brown
Ag	Yellow
Steel	Blue
Cu	L yellow
Mg	Green-brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (3:1) of O-65-19 and O-65-21.

TEST NO. 203-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1118[a] AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.28	–	3.84	0.09	–			
16 hr	17.23	12.8	4.17	0.49	29.4			
24 hr	18.58	21.6	4.40	0.53	41.4			
40 hr	22.51	47.3	5.07	0.70	59.1			
48 hr	25.57	67.3	5.57	0.80	63.3	44	1.54	9.27

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	+0.02
Ag	+0.04
Steel	+0.02
Cu	−0.14
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	L brown
Ag	Yellow
Steel	Blue
Cu	L yellow
Mg	Green-brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (1:9) of O-65-19 and O-65-21.

TEST NO. 203-5. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1119[a] AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	17.41	–	4.55	0.23				
16 hr	18.75	7.7	4.82	0.58	30.5			
24 hr	20.06	15.2	5.10	0.64	44.0			
40 hr	24.58	41.2	6.06	0.80	68.0			
48 hr	30.44	74.8	7.28	0.95	77.1	46	1.59	10.53

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	0.00
Ag	+0.04
Steel	0.00
Cu	−0.14
Mg	+0.02

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Brown
Ag	Yellow
Steel	Blue
Cu	Yellow
Mg	Green-brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	Heavy

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (9:1) of O-65-19 and O-65-21.

TEST NO. 203-6. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-19 AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	17.72	–	4.67	0.25	–			
16 hr	19.03	7.4	4.91	0.61	28.5			
24 hr	20.23	14.2	5.19	0.69	41.4			
40 hr	24.58	38.7	6.16	0.81	64.9			
48 hr	29.18	64.7	7.21	0.94	74.4	45	1.59	10.68

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.02
Ag	+0.06
Steel	+0.04
Cu	−0.14
Mg	+0.04

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Brown
Ag	Yellow
Steel	Blue
Cu	Yellow
Mg	Green-brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 204-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1126[a] AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.21		4.14	0.16				
16 hr	17.81	9.9	4.44	0.53	29.0			
24 hr	19.09	17.8	4.69	0.58	41.0			
40 hr	23.43	44.5	5.51	0.77	59.8			
48 hr	27.65	70.6	6.30	0.97	64.9	46	1.48	9.87

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	+0.12
Ag	+0.02
Steel	+0.06
Cu	0.10
Mg	+0.08

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	L brown
Ag	Yellow
Steel	Blue
Cu	Green-brown
Mg	Brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (1:1) of O-65-18 and O-65-21.

TEST NO. 204-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1127[a] AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.62	–	3.95	0.12	–			
16 hr	17.45	11.7	4.25	0.52	30.9			
24 hr	18.69	19.7	4.48	0.57	43.8			
40 hr	22.41	43.5	5.13	0.72	64.5			
48 hr	25.54	63.5	5.68	0.95	71.0	44	1.54	9.54

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	+0.04
Ag	+0.04
Steel	+0.10
Cu	-0.04
Mg	+0.06

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	L brown
Ag	Yellow
Steel	Blue
Cu	Green-brown
Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (1:3) of O-65-18 and O-65-21.

TEST NO. 204-3. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1128[a] AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.86	-	4.37	0.20	–			
16 hr	18.19	7.9	4.61	0.56	29.4			
24 hr	19.36	14.8	4.85	0.60	42.5			
40 hr	23.27	38.0	5.64	0.79	66.9			
48 hr	26.98	60.0	6.37	0.99	76.0	46	1.65	10.29

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	+0.04
Ag	0.00
Steel	+0.14
Cu	-0.10
Mg	+0.18

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	L brown
Ag	Yellow
Steel	Blue
Cu	Brown
Mg	Brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (3:1) of O-65-18 and O-65-21.

TEST NO. 204-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1129[a] AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.31	–	3.84	0.09	–			
16 hr	17.50	14.3	4.19	0.47	30.3			
24 hr	18.87	23.3	4.43	0.54	42.2			
40 hr	22.75	48.6	5.08	0.71	59.8			
48 hr	25.79	68.5	5.57	0.86	67.6	43	1.53	9.28

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.04
Ti	0.00
Ag	+0.02
Steel	+0.06
Cu	−0.12
Mg	+0.08

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	L brown
Ag	Yellow
Steel	Blue
Cu	Green-brown
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (1:9) of O-65-18 and O-65-21.

TEST NO. 204-5. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON J-1130[a] AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	17.30		4.50	0.22				
16 hr	18.70	8.1	4.79	0.57	31.3			
24 hr	19.97	15.4	5.07	0.63	45.0			
40 hr	24.89	43.9	6.12	0.78	69.8			
48 hr	31.06	79.5	7.41	0.96	79.1	47	1.40	10.56

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.06
Ti	+0.02
Ag	+0.14
Steel	+0.02
Cu	−0.04
Mg	+0.10

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	L brown
Ag	Yellow
Steel	Blue
Cu	Green-brown
Mg	Brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (9:1) of O-65-18 and O-65-21.

TEST NO. 204-6. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-18 AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	17.55	--	4.61	0.21	--			
16 hr	18.88	7.6	4.87	0.61	28.8			
24 hr	20.11	14.6	5.16	0.63	41.9			
40 hr	24.49	39.5	6.15	0.77	66.3			
48 hr	29.34	67.2	7.19	0.90	76.1	46	1.48	10.70

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.04
Ti	+0.06
Ag	+0.04
Steel	+0.04
Cu	-0.04
Mg	+0.12

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	L brown
Ag	Yellow
Steel	Blue
Cu	Green-brown
Mg	Brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 205-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON K-1004[a] AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.06	--	4.12	0.17	--			
16 hr	17.61	9.7	4.39	0.51	28.0			
24 hr	18.81	17.1	4.62	0.65	40.0			
40 hr	22.69	41.3	5.35	0.83	59.5			
48 hr	26.62	65.8	6.05	0.98	64.9	45	1.55	9.95

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	0.00
Ag	0.00
Steel	-0.02
Cu	-0.12
Mg	+0.02

Metal discoloration, deposits, pitting, or etching:

Al	L tan
Ti	L brown
Ag	L tan
Steel	Blue
Cu	L green
Mg	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (1:1) of O-65-19 and O-65-25.

TEST NO. 205-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON K-1005[a] AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.38	–	3.88	0.12	–			
16 hr	17.07	11.0	4.17	0.47	30.9			
24 hr	18.23	18.5	4.36	0.56	44.0			
40 hr	21.68	41.0	4.99	0.75	65.3			
48 hr	24.53	59.5	5.47	0.91	72.3	43	1.51	9.41

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	+0.02
	Ag	0.00
	Steel	+0.02
	Cu	−0.12
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	L tan
	Ti	L brown
	Ag	L tan
	Steel	Blue
	Cu	L brown
	Mg	L pink

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (1:3) of O-65-19 and O-65-25.

TEST NO. 205-3. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON K-1006[a] AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.87	–	4.38	0.20	–			
16 hr	18.11	7.4	4.62	0.56	29.2			
24 hr	19.33	14.6	4.85	0.66	42.4			
40 hr	23.10	36.9	5.52	0.88	66.4			
48 hr	27.10	60.6	6.39	1.05	75.6	45	1.68	10.27

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	0.00
	Ag	−0.02
	Steel	0.00
	Cu	−0.12
	Mg	+0.02
Metal discoloration, deposits pitting, or etching:	Al	L tan
	Ti	L brown
	Ag	Tan
	Steel	Blue
	Cu	L green
	Mg	L pink

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (3:1) of O-65-19 and O-65-25.

TEST NO. 205-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON K-1007[a] AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	14.95	–	3.78	0.09	–			
16 hr	16.78	12.2	4.05	0.45	29.4			
24 hr	18.02	20.5	4.27	0.52	41.5			
40 hr	21.69	45.1	4.88	0.73	59.1			
48 hr	24.50	63.9	5.38	0.91	63.3	43	1.43	9.28

Metal Specimen Data

Weight change, mg/cm²:

Al	-0.02
Ti	0.00
Ag	-0.02
Steel	0.00
Cu	-0.10
Mg	-0.02

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	Tan
Steel	Blue
Cu	Brown
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (1:9) of O-65-19 and O-65-25.

TEST NO. 205-5. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON K-1008[a] AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	17.38	–	4.54	0.23	–			
16 hr	18.76	7.9	4.81	0.58	30.3			
24 hr	20.04	15.3	5.09	0.66	43.8			
40 hr	24.71	42.2	6.09	0.86	68.6			
48 hr	30.09	73.1	7.27	1.07	78.3	47	1.74	10.54

Metal Specimen Data

Weight change, mg/cm²:

Al	-0.02
Ti	0.00
Ag	0.00
Steel	0.00
Cu	-0.04
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	L tan
Ti	Brown
Ag	L tan
Steel	Blue
Cu	L green
Mg	L pink

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Blend (9:1) of O-65-19 and O-65-25.

TEST NO. 205-6. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-21 AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.11	–	3.76	0.07	–			
16 hr	16.99	12.4	4.07	0.48	29.4			
24 hr	18.18	20.3	4.27	0.55	41.0			
40 hr	21.57	42.8	4.86	0.76	58.8			
48 hr	24.11	59.6	5.24	0.88	64.1	40	1.57	9.01

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	+0.02
Steel	0.00
Cu	-0.08
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	L tan
Steel	Blue
Cu	Brown
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 207-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-25 AT 375°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	14.71	–	3.67	0.07	–			
16 hr	16.35	11.2	3.93	0.46	27.0			
24 hr	17.41	18.4	4.13	0.59	38.5			
40 hr	20.68	40.6	4.64	0.76	56.5			
48 hr	23.06	56.8	5.02	0.94	61.6	39	1.54	9.03

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	0.00
Steel	0.00
Cu	-0.02
Mg	-0.04

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Brown
Ag	Yellow
Steel	Blue
Cu	Orange & brown
Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	375
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 208-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-25 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.71	–	3.67	0.07	
16 hr	16.81	14.3	4.00	0.56	
24 hr	18.33	24.6	4.26	0.67	
40 hr	23.05	56.7	5.01	1.05	
48 hr	26.32	78.9	5.50	1.33	47

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	0.00
Ag	0.00
Steel	+0.04
Cu	−0.18
Mg	+0.04

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Yellow-tan
Ag	L yellow
Steel	Blue
Cu	Brown-green
Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 208-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-31 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.40	–	3.23	0.08	
16 hr	15.33	14.4	3.54	0.25	
24 hr	16.44	22.7	3.71	0.43	
40 hr	19.41	44.9	4.13	0.69	
48 hr	21.72	62.1	4.44	0.74	44

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	0.00
Steel	+0.04
Cu	0.00
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Tan
Ag	L yellow
Steel	Brown-blue
Cu	Orange
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 208-3. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-25 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	14.71	–	3.67	0.07	–			
16 hr	17.04	15.8	4.04	0.57	37.3			
24 hr	18.60	26.4	4.29	0.68	51.4			
40 hr	23.28	58.3	5.03	1.05	70.0			
48 hr	26.14	77.7	5.47	1.30	73.2	48	1.68	9.24

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	0.00
	Steel	0.00
	Cu	−0.20
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Yellow-tan
	Ag	L yellow
	Steel	Blue
	Cu	Brown-green
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 208-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-31 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	13.40	–	3.23	0.08	–			
16 hr	15.45	15.3	3.56	0.25	37.3			
24 hr	16.69	24.6	3.74	0.43	52.4			
40 hr	20.23	51.0	4.26	0.69	74.5			
48 hr	23.02	71.8	4.60	0.74	80.0	47	1.07	10.32

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	+0.02
	Steel	+0.02
	Cu	−0.02
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Yellow
	Ag	L yellow
	Steel	Brown-blue
	Cu	Orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 210-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-14 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.71	–	4.67	0.24	
48 hr	17.36	−2.0	4.54	0.84	
96 hr	17.36	−2.0	4.53	1.10	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−0.08
	Mg	+0.08
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L brown
	Ag	L yellow
	Steel	Purple
	Cu	Green-pink
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	96+ hr
100°F vis	96+ hr

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 210-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-18 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.55		4.61	0.21	
48 hr	17.34	−1.2	4.51	0.84	
96 hr	17.27	−1.6	4.50	1.10	2

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	−0.10
	Mg	+0.10
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L brown
	Ag	L yellow
	Steel	Purple
	Cu	Pink-brown
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	96+ hr
100°F vis	96+ hr

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 210-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-19 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.72	–	4.67	0.25	
48 hr	17.45	−1.5	4.55	0.86	
96 hr	17.38	−1.9	4.52	1.13	2

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	+0.02
	Steel	+0.04
	Cu	−0.10
	Mg	+0.06
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L brown
	Ag	L yellow
	Steel	Purple
	Cu	Pink-brown
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	96+ hr
100°F vis	96+ hr

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 210-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-21 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.11	–	3.76	0.07	
48 hr	15.43	+2.1	3.81	0.70	
96 hr	15.56	+3.0	3.80	0.91	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	+0.02
	Steel	+0.02
	Cu	−0.16
	Mg	+0.04
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L brown
	Ag	L yellow
	Steel	Purple
	Cu	Brown-purple
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	96+ hr
100°F vis	96+ hr

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 210-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON [illegible]

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.71		3.67	0.07	
48 hr	14.94	+1.6	3.68	0.71	
96 hr	14.95	+1.6	3.67	1.01	2

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	Trace
	Ag	+0.02			
	Steel	+0.02	Tube deposits:	Below oil level	None
	Cu	−0.16		At and above oil level	L var
	Mg	+0.02			
Metal discoloration, deposits, pitting, or etching:			Breakpoint Data		
	Al	L yellow	Neut. no.	96+ hr	
	Ti	L brown	100°F vis	96+ hr	
	Ag	L yellow			
	Steel	Purple	Test Conditions		
	Cu	Purple-brown			
	Mg	L yellow	Sample temperature, °F	347	
			Sample volume, ml	200	
			Air rate, liter/hr	10	
			Condensate return	Yes	

TEST NO. 211-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-14 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/216°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.71		4.67	0.24	
96 hr	17.52	−1.1	4.59	1.10	
144 hr	17.48	−1.3	4.56	1.29	5

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	Trace
	Ag	0.00			
	Steel	0.00	Tube deposits:	Below oil level	L var
	Cu	−0.16		At and above oil level	None
	Mg	+0.04			
Metal discoloration, deposits, pitting, or etching:			Breakpoint Data		
	Al	L yellow	Neut. no.	144+ hr	
	Ti	Tan-blue	100°F vis	144+ hr	
	Ag	L yellow			
	Steel	Blue	Test Conditions		
	Cu	Green-brown			
	Mg	L yellow	Sample temperature, °F	347	
			Sample volume, ml	200	
			Air rate, liter/hr	10	
			Condensate return	Yes	

TEST NO. 211-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-18 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.55		4.61	0.21	
96 hr	17.24	-1.8	4.47	1.13	
144 hr	17.18	-2.1	4.47	1.25	2

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	0.00	Sludge in oil	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	Trace
	Ag	0.00	Tube deposits:	Below oil level	None
	Steel	0.00		At and above oil level	L var
	Cu	-0.18	**Breakpoint Data**		
	Mg	+0.04	Neut. no.	144+ hr	
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	100°F vis	144+ hr	
	Ti	L brown	**Test Conditions**		
	Ag	L yellow	Sample temperature, °F	347	
	Steel	Blue	Sample volume, ml	200	
	Cu	Brown-green	Air rate, liter/hr	10	
	Mg	L yellow	Condensate return	Yes	

TEST NO. 211-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-19 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.72		4.67	0.25	
96 hr	17.43	-1.6	4.53	1.12	
144 hr	17.36	-2.0	4.51	1.31	3

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	Trace
	Ag	+0.02	Tube deposits:	Below oil level	None
	Steel	0.00		At and above oil level	L var
	Cu	-0.14	**Breakpoint Data**		
	Mg	0.00	Neut. no.	144+ hr	
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	100°F vis	144+ hr	
	Ti	Brown-blue	**Test Conditions**		
	Ag	L yellow	Sample temperature, °F	347	
	Steel	Blue	Sample volume, ml	200	
	Cu	Brown-green	Air rate, liter/hr	10	
	Mg	Green-yellow	Condensate return	Yes	

TEST NO. 211-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-25 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.11		3.76	0.07	
96 hr	15.45	2.3	3.80	0.90	
144 hr	15.45	2.3	3.79	1.01	3

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	−0.02		Centrifuge, vol %	Trace
	Ag	0.00			
	Steel	+0.02	Tube deposits:	Below oil level	None
	Cu	−0.18		At and above oil level	L. var
	Mg	−0.12			
			Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Neut. no.	144+ hr	
	Ti	Brown	100°F vis	144+ hr	
	Ag	L yellow			
	Steel	Blue	Test Conditions		
	Cu	Brown-green			
	Mg	No change	Sample temperature, °F	347	
			Sample volume, ml	200	
			Air rate, liter/hr	10	
			Condensate return	Yes	

TEST NO. 211-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-25 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.71		3.67	0.07	
96 hr	15.13	2.9	3.71	0.84	
144 hr	15.17	3.1	3.70	0.96	4

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	Trace
	Ag	0.00			
	Steel	+0.02	Tube deposits:	Below oil level	None
	Cu	−0.18		At and above oil level	L. var
	Mg	−0.14			
			Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Neut. no.	144+ hr	
	Ti	Brown	100°F vis	144+ hr	
	Ag	L yellow			
	Steel	Blue	Test Conditions		
	Cu	Brown pink			
	Mg	No change	Sample temperature, °F	347	
			Sample volume, ml	200	
			Air rate, liter/hr	10	
			Condensate return	Yes	

TEST NO. 212-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-14 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.71		4.67	0.24	
144 hr	17.49	−1.2	4.56	1.30	
192 hr	17.31	−2.3	4.51	1.56	6

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	0.00	Sludge in oil:	200 mesh filter	None
	Ti	+0.02		Centrifuge, vol %	Trace
	Ag	0.00			
	Steel	+0.04	Tube deposits:	Below oil level	None
	Cu	−0.12		At and above oil level	M var
	Mg	+0.06			
			Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no.	192+ hr	
	Ti	L blue	100°F vis	192+ hr	
	Ag	Tan			
	Steel	Blue-green	Test Conditions		
	Cu	L green			
	Mg	Tan	Sample temperature, °F	347	
			Sample volume, ml	200	
			Air rate, liter/hr	10	
			Condensate return	Yes	

TEST NO. 212-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-14 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.71		4.67	0.24	
144 hr	17.38	−1.9	4.54	1.37	
192 hr	17.25	−2.6	4.49	1.54	4

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	−0.02		Centrifuge, vol %	Trace
	Ag	0.00			
	Steel	+0.06	Tube deposits:	Below oil level	None
	Cu	−0.12		At and above oil level	M var
	Mg	+0.10			
			Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	No change	Neut. no.	192+ hr	
	Ti	Tan	100°F vis	192+ hr	
	Ag	Tan			
	Steel	Blue-green	Test Conditions		
	Cu	L green			
	Mg	Tan	Sample temperature, °F	347	
			Sample volume, ml	200	
			Air rate, liter/hr	10	
			Condensate return	Yes	

TEST NO. 212-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-18 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.55		4.61	0.21	
144 hr	17.40	−0.9	4.53	1.35	
192 hr	17.27	−1.6	4.50	1.50	6

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	−0.02
	Ag	−0.02
	Steel	+0.04
	Cu	−0.20
	Mg	+0.10
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L brown
	Ag	Tan
	Steel	Blue
	Cu	Rose-green
	Mg	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	M var

Breakpoint Data

Neut. no.	192+ hr
100°F vis	192+ hr

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 212-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-19 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.72	—	4.67	0.25	
144 hr	17.33	−2.2	4.51	1.34	
192 hr	17.17	−3.1	4.47	1.60	4

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	+0.04
	Steel	+0.02
	Cu	−0.14
	Mg	+0.06
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L brown
	Ag	Tan
	Steel	Blue
	Cu	Rose-green
	Mg	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	M var

Breakpoint Data

Neut. no.	192+ hr
100°F vis	192+ hr

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 212-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-21 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.11		3.76	0.07	
144 hr	15.55	+2.9	3.83	1.10	
192 hr	15.69	+3.7	3.82	1.17	6

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	−0.02		Centrifuge, vol %	None
	Ag	0.00			
	Steel	+0.02	Tube deposits:	Below oil level	None
	Cu	−0.14		At and above oil level	L var
	Mg	+0.02			
			Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Neut. no.	192+ hr	
	Ti	Brown	100°F vis	192+ hr	
	Ag	L yellow			
	Steel	Blue	Test Conditions		
	Cu	Rose-brown			
	Mg	No change	Sample temperature, °F	347	
			Sample volume, ml	200	
			Air rate, liter/hr	10	
			Condensate return	Yes	

TEST NO. 212-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-25 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.71		3.67	0.07	
144 hr	14.92	+1.4	3.66	1.22	
192 hr	14.91	+1.4	3.66	1.26	2

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	0.00			
	Steel	+0.02	Tube deposits:	Below oil level	None
	Cu	−0.16		At and above oil level	L var
	Mg	+0.04			
			Breakpoint Data		
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Neut. no.	192+ hr	
	Ti	Brown	100°F vis	192+ hr	
	Ag	L yellow			
	Steel	Blue	Test Conditions		
	Cu	Rose-brown			
	Mg	No change	Sample temperature, °F	347	
			Sample volume, ml	200	
			Air rate, liter/hr	10	
			Condensate return	Yes	

TEST NO. 213-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-33 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	18.12	-	4.09	0.14	
16 hr	18.71	3.3	4.15	0.19	
24 hr	18.99	4.8	4.18	0.32	
40 hr	19.46	7.4	4.25	0.37	
48 hr	19.93	10.0	4.32	0.37	24

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	0.00
	Steel	0.00
	Cu	-0.16
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Tan
	Ag	No change
	Steel	Blue
	Cu	L brown
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 213-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-37 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.37	-	3.43	0.34	
16 hr	60.42	[illegible]	8.30	11.37	
24 hr	249.9	[illegible]	15.02	18.98	
40 hr	2722	19,000	136.8	24.3	
48 hr	Gelled	-	-	-	49

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	0.00
	Steel	0.00
	Cu	-5.70
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Tan
	Ag	No change
	Steel	Blue-green
	Cu	H etching
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 213-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-1 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.92		3.19	0.27	
16 hr	18.00	39.3	3.94	0.44	
24 hr	20.23	56.6	4.27	0.71	
40 hr	23.99	85.7	4.75	0.85	
48 hr	25.54	97.7	4.97	0.86	45

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	+0.02
Steel	+0.02
Cu	−0.10
Mg	0.04

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Tan
Ag	No change
Steel	Blue-green
Cu	L brown
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 213-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-3 AT 385°F

	Vis, cs 100°F	100°F Vis Increase, %	Vis, cs 210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	18.12		4.09	0.14				
16 hr	18.68	3.1	4.14	0.18	[illegible]			
24 hr	19.01	4.9	4.20	0.32	18.2			
40 hr	19.45	7.3	4.28	0.37	28.[illegible]			
48 hr	19.91	9.9	4.38	0.38	33.2	24	2.52	14.94

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	0.00
Steel	0.00
Cu	0.12
Mg	0.02

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Tan
Ag	No change
Steel	Blue
Cu	L brown
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 213-5. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-37 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	14.37		3.43	0.34				
16 hr	63.62	343	8.57	12.23	42.6			
24 hr	159.6	1 011	15.78	16.83	52.3			
40 hr	3831	26,.60	148.8	24.3	58.5			
48 hr	Gelled	--	--	--	58.9	51	72.9	7.89

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	0.00
Steel	0.00
Cu	-5.40
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Tan
Ag	No change
Steel	Blue-green
Cu	H etching
Mg	No change

Test Cell Data

Sludge in oil: 200-mesh filter
Centrifuge, vol %

Tube deposits: Below oil level — L var
At and above oil level — L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 213-6. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-66-1 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No. mg KOH/g	Overhead Wt, g	Oil Los., wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	12.92	--	3.19	0.27				
16 hr	18.02	39.5	3.96	0.42	48.4			
24 hr	20.26	56.8	4.26	0.70	59.5			
40 hr	23.98	85.6	4.76	0.84	67.3			
48 hr	25.57	97.9	4.97	0.84	68.4	44	1.37	7.58

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	+0.02
Steel	0.00
Cu	0.06
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Tan
Ag	No change
Steel	Blue-green
Cu	L brown
Mg	No change

Test Cell Data

Sludge in oil: 200-mesh filter — None
Centrifuge, vol % — None

Tube deposits: Below oil level — None
At and above oil level — None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 214-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-9 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.61		4.11	0.27	
16 hr	17.60	12.7	4.50	0.73	
24 hr	19.21	23.1	4.84	0.84	
40 hr	30.06	92.6	6.97	1.31	
48 hr	175.6	1025	28.70	3.29	61

Metal Specimen Data

Weight change, mg/cm²:	Al	-0.02
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	0.06
	Mg	+0.04
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L brown
	Ag	L yellow
	Steel	Blue
	Cu	Brown
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	(a)
Tube deposits:	Below oil level	1 var
	At and above oil level	1 var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

(a) Insufficient sample.

TEST NO. 214-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-2 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.64		3.33	0.05	
16 hr	15.70	13.4	3.65	0.42	
24 hr	16.79	21.3	3.78	0.62	
40 hr	20.32	46.8	4.28	0.84	
48 hr	23.92	72.8	4.76	0.94	44

Metal Specimen Data

Weight change, mg/cm²:	Al	0.02
	Ti	0.02
	Ag	0.00
	Steel	+0.02
	Cu	0.02
	Mg	0.02
Metal discoloration, deposits, pitting or etching:	Al	No change
	Ti	Tan
	Ag	L yellow
	Steel	Blue
	Cu	Yellow-orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 214-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-3 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.32		4.31	0.14	
16 hr	18.27	11.9	4.67	0.67	
24 hr	19.83	21.5	5.03	0.78	
40 hr	28.62	75.4	6.78	1.13	
48 hr	52.69	223	11.18	1.76	60

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	0.06	Sludge in oil:	200-mesh filter	None
	Ti	−0.04		Centrifuge, vol %	None
	Ag	+0.02			
	Steel	+0.02	Tube deposits:	Below oil level	None
	Cu	−0.06		At and above oil level	L var
	Mg	0.00			
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Test Conditions		
	Ti	L brown	Sample temperature, °F		385
	Ag	L yellow	Sample volume, ml		200
	Steel	Blue	Air rate, liter/hr		130
	Cu	Brown	Condensate return		Yes
	Mg	L yellow			

TEST NO. 214-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-39 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.61		4.11	0.27				
16 hr	17.49	12.0	4.48	0.73	40.8			
24 hr	18.97	21.5	4.80	0.84	59.8			
40 hr	27.18	74.1	6.39	1.28	93.3			
48 hr	52.73	238	11.06	1.99	104.5	62	1.64	10.58

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm².	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	(a)
	Ag	0.00			
	Steel	0.00	Tube deposits:	Below oil level	L var
	Cu	0.06		At and above oil level	L var
	Mg	+0.02			
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	Test Conditions		
	Ti	L brown	Sample temperature, °F		385
	Ag	L yellow	Sample volume, ml		200
	Steel	Blue	Air rate, liter/hr		130
	Cu	Brown	Condensate return		No
	Mg	L yellow			

(a) Insufficient sample.

TEST NO. 214-5. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-66-2 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	13.84	-	3.33	0.05	-			
16 hr	15.84	14.5	3.65	0.44	32.4			
24 hr	17.05	23.2	3.83	0.65	45.8			
40 hr	21.37	54.4	4.42	0.88	67.9			
48 hr	26.67	92.7	5.10	0.96	74.4	47	1.59	10.51

Metal Specimen Data

Weight change, mg/cm²:

Al	-0.04
Ti	0.00
Ag	+0.02
Steel	0.00
Cu	-0.04
Mg	-0.04

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Tan
Ag	L yellow
Steel	Blue
Cu	Yellow-orange
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 214-6. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-66-3 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.32	-	4.31	0.14	-			
16 hr	18.17	11.3	4.66	0.68	36.7			
24 hr	19.72	20.8	5.02	0.79	53.9			
40 hr	28.32	73.5	6.72	1.12	85.1			
48 hr	50.47	209	10.85	1.68	96.2	58	1.46	10.53

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.08
Ti	+0.02
Ag	+0.02
Steel	0.00
Cu	-0.02
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	L brown
Ag	L yellow
Steel	Blue
Cu	Brown
Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 222-1. RESULTS OF REFLUX OXIDATION CORROSION TEST ON O-65-20 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.75		4.68	0.26	
16 hr	19.35	9.0	5.02	0.77	
24 hr	21.05	18.6	5.37	0.92	
40 hr	27.35	54.1	6.77	1.27	
48 hr	39.43	122	9.22	1.80	56

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	0.00
Ag	+0.02
Steel	0.00
Cu	−0.06
Mg	+0.10

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Purple-brown
Ag	L pink
Steel	Blue-green
Cu	Orange-green
Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	(a)
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

(a) Insufficient sample.

TEST NO. 222-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-65-20 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	17.75		4.68	0.26				
16 hr	19.43	9.5	5.00	0.79	38.4			
24 hr	21.16	19.2	5.39	0.92	55.7			
40 hr	28.25	59.2	6.93	1.27	84.8			
48 hr	43.37	144	10.07	1.77	94.9	57	1.75	10.90

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	+0.02
Ag	0.00
Steel	+0.02
Cu	−0.06
Mg	+0.10

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Purple-brown
Ag	L pink
Steel	Blue-green
Cu	Orange-green
Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	(a)
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Insufficient sample

TEST NO. 223-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-14 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.71	–	4.63	0.24	
16 hr	17.11	−3.4	4.50	1.17	
24 hr	16.97	−4.2	4.42	1.46	
40 hr	15.90	−10.2	4.07	4.20	
48 hr	16.82	−5.0	4.07	13.07	5

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	−0.43
	Mg	−0.83
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Blue
	Ag	No change
	Steel	Blue-green
	Cu	Orange-brown
	Mg	L pitting

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	H var

Breakpoint Data

Neut. no.	31 hr
100°F vis	45 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 223-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-18 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.55	–	4.61	0.21	
16 hr	17.06	−2.8	4.48	1.19	
24 hr	16.94	−3.5	4.40	1.42	
40 hr	16.49	−6.0	4.27	2.03	
48 hr	15.99	−8.9	3.97	8.84	2

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	−0.34
	Mg	−0.18
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Purple
	Ag	L yellow
	Steel	Blue
	Cu	Orange-brown
	Mg	I pitting

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	H var

Breakpoint Data

Neut. no.	40 hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 223-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-19 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.72		4.67	0.25	
16 hr	17.04	−3.8	4.44	1.17	
24 hr	16.95	−4.3	4.37	1.40	
40 hr	16.54	−6.7	4.28	2.12	
48 hr	15.82	−10.7	3.98	8.02	3

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.02
Ag	0.00
Steel	+0.02
Cu	−0.20
Mg	+6.04

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Purple
Ag	L yellow
Steel	Blue
Cu	Orange-brown
Mg	Yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	M var

Breakpoint Data

Neut. no.	39 hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 223-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-21 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.11		3.76	0.07	
16 hr	15.26	+1.0	3.75	1.02	
24 hr	15.26	+1.0	3.74	1.21	
40 hr	15.08	−0.2	3.70	1.49	
48 hr	15.14	+0.2	3.75	1.63	3

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	0.00
Steel	+0.02
Cu	0.14
Mg	+0.04

Metal discoloration, deposits, pitting, or etching

Al	L yellow
Ti	Brown
Ag	L yellow
Steel	Blue
Cu	Purple-green
Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 223-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-25 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.71		3.67	0.07	
16 hr	14.64	-0.5	3.65	0.92	
24 hr	14.81	+0.7	3.65	1.16	
40 hr	14.75	+0.3	3.64	1.38	
48 hr	14.81	+0.7	3.61	1.62	3

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	0.00
	Ag	-0.02
	Steel	+0.02
	Cu	-0.16
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown
	Ag	L yellow
	Steel	Blue
	Cu	Purple-green
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 223-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-31 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.40		3.23	0.08	
16 hr	14.14	5.5	3.35	0.42	
24 hr	14.29	6.6	3.36	0.59	
40 hr	14.51	8.3	3.42	0.83	
48 hr	14.64	9.3	3.44	0.93	1

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.04
	Cu	+0.14
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	No change
	Steel	Blue
	Cu	Orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 224-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-14 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.71	-	4.67	0.24	
16 hr	17.46	−1.4	4.55	1.03	
24 hr	17.40	−1.8	4.53	1.20	
40 hr	17.24	−2.7	4.49	1.47	
48 hr	17.13	−3.3	4.46	1.63	4

Metal Specimen Data

Weight change, mg/cm²:	Al	-
	Ti	-
	Ag	-
	Steel	-
	Cu	−0.04
	Mg	+0.16
Metal discoloration, deposits, pitting, or etching:	Al	-
	Ti	-
	Ag	-
	Steel	-
	Cu	Yellow
	Mg	Yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	M var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 224-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-14 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.71		4.67	0.24	
16 hr	19.51	10.2	5.03	0.73	
24 hr	21.17	19.5	5.42	0.74	
40 hr	32.50	83.5	6.07	23.2	
48 hr	879.6	4866	59.26	22.3	58

Metal Specimen Data

Weight change, mg/cm²:	Al	
	Ti	
	Ag	
	Steel	
	Cu	11.3
	Mg	9.5
Metal discoloration, deposits, pitting, or etching:	Al	
	Ti	
	Ag	
	Steel	
	Cu	H pitting
	Mg	H pitting

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	(a)
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 224-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-18 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.55	-	4.61	0.21	
16 hr	17.30	−1.4	4.52	1.00	
24 hr	17.24	−1.8	4.51	1.19	
40 hr	17.06	−2.8	4.44	1.53	
48 hr	15.92	−9.3	4.08	3.83	1

Metal Specimen Data

Weight change, mg/cm²:	Al	-
	Ti	-
	Ag	-
	Steel	-
	Cu	−0.47
	Mg	−0.24
Metal discoloration, deposits, pitting, or etching:	Al	-
	Ti	
	Ag	
	Steel	-
	Cu	Yellow
	Mg	Yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	M var

Breakpoint Data

Neut. no.	42 hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 224-4 RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-18 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.55		4.61	0.21	
16 hr	19.50	11.1	5.03	0.71	
24 hr	21.26	21.1	5.44	0.73	
40 hr	28.79	64.0	7.12	1.03	
48 hr	42.61	143	10.12	1.13	54

Metal Specimen Data

Weight change, mg/cm²:	Al	
	Ti	
	Ag	
	Steel	
	Cu	+0.22
	Mg	+0.22
Metal discoloration, deposits, pitting, or etching:	Al	
	Ti	
	Ag	
	Steel	
	Cu	Yellow
	Mg	Yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	(a)
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	120
Condensate return	Yes

(a) Insufficient sample.

TEST NO. 224-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-2 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.84		3.33	0.05	
16 hr	14.50	4.8	3.44	0.53	
24 hr	14.68	6.1	3.49	0.78	
40 hr	14.91	7.7	3.51	1.03	
48 hr	15.07	8.9	3.53	1.14	1

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.04
	Cu	0.00
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	L yellow
	Steel	Blue-green
	Cu	Yellow
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 224-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-11 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.41		4.30	0.16	
16 hr	16.05	−2.2	4.18	0.21	
24 hr	15.96	−2.7	4.17	0.27	
40 hr	15.64	−4.7	3.82	7.29	
48 hr	18.59	+13.3	4.21	13.57	4

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	0.00
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown
	Ag	L yellow
	Steel	Blue-green
	Cu	Orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	31 hr
100°F vis	41 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 225-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-11 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.41		4.30	0.16	
16 hr	16.38	−0.2	4.28	0.09	
24 hr	16.49	+0.5	4.34	0.12	
40 hr	40.00	+144	6.90	29.9	
48 hr	120.6	+635	14.25	45.2	44

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	−0.06
	Steel	0.00
	Cu	−0.22
	Mg	−0.12
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown-purple
	Ag	Gray
	Steel	Blue-green
	Cu	L etching
	Mg	L pitting

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	Yes

TEST NO. 225-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-66-11 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.41		4.30	0.16				
16 hr	16.41	0.0	4.28	0.10	15.4			
24 hr	16.59	1.1	4.33	0.12	23.0			
40 hr	47.33	188	7.67	33.9	53.6			
48 hr	144.4	780	15.79	47.9	63.5	45	29.2	8.97

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	0.06
	Steel	0.00
	Cu	0.30
	Mg	0.30
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown-purple
	Ag	Gray
	Steel	Blue-green
	Cu	L etching
	Mg	L pitting

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 226-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-2 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	27.50		5.05	0.09	
16 hr	29.82	8.4	5.31	0.21	
24 hr	30.41	10.6	5.41	0.28	
40 hr	31.10	13.1	5.48	0.37	
48 hr	31.54	14.7	5.54	0.41	4

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	+0.02
Steel	+0.04
Cu	0.00
Mg	+0.10

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L tan
Ag	Yellow
Steel	Blue
Cu	Orange-rose
Mg	L pitting

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 226-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-12 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.76	–	3.52	0.37	
16 hr	15.03	9.2	3.73	1.25	
24 hr	15.14	10.0	3.75	1.44	
40 hr	14.90	8.3	3.71	1.85	
48 hr	14.73	7.0	3.69	2.10	2

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.10
Ti	+0.20
Ag	+0.12
Steel	+0.14
Cu	+0.02
Mg	+0.18

Metal discoloration, deposits, pitting, or etching:

Al	Dark brown
Ti	Brown
Ag	Dark brown
Steel	Dark brown-blue
Cu	Dark brown-orange
Mg	Dark brown

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	0.2
Tube deposits:	Below oil level	H var
	At and above oil level	H var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 226-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-18 AT 385°F

	Vis cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.76		4.29	0.12	
16 hr	17.04	+1.6	4.29	1.39	
24 hr	17.02	+1.6	4.27	1.71	
40 hr	16.73	−1.8	4.19	2.38	
48 hr	16.41	−2.1	4.05	5.13	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	+0.02
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	L blue
	Ti	L blue
	Ag	No change
	Steel	L green-blue
	Cu	Orange
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	H var

Breakpoint Data

Neut. no	40 hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 226-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-40 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.69		3.30	0.11	
16 hr	14.47	5.7	3.42	0.34	
24 hr	14.62	6.8	3.46	0.50	
40 hr	14.85	8.5	3.49	0.73	
48 hr	14.97	9.3	3.51	0.93	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.04
	Cu	+0.02
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	L yellow
	Steel	Brown-blue
	Cu	Orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 226-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-9 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.89	–	3.34	0.06	
16 hr	14.60	5.1	3.45	0.56	
24 hr	14.77	6.3	3.49	0.72	
40 hr	15.02	8.1	3.52	1.01	
48 hr	15.15	9.1	3.54	1.14	2

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	0.00
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	L yellow
	Steel	Blue
	Cu	Yellow
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 226-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-26 AT 385°F

	cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.75	–	3.10	0.35	
16 hr	13.49	5.8	3.22	0.40	
24 hr	13.74	7.8	3.27	0.46	
40 hr	14.04	10.1	3.31	0.47	
48 hr	14.15	11.0	3.35	0.52	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	0.00
	Mg	+0.04
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L tan
	Ag	L yellow
	Steel	Brown-yellow
	Cu	Brown
	Mg	L brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	0.2
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 227-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-23 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.62	–	3.15	0.20	
16 hr	13.28	5.2	3.26	0.57	
24 hr	13.48	6.8	3.31	0.70	
40 hr	13.71	8.6	3.35	1.08	
48 hr	13.74	8.9	3.35	1.18	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	+0.06
	Mg	+0.14
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	No change
	Steel	Peacock
	Cu	Brown-orange
	Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 227-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-37 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.37	–	3.43	0.34	
16 hr	16.57	15.3	3.73	3.09	
24 hr	18.67	29.9	4.02	5.64	
40 hr	23.33	62.4	4.72	9.75	
48 hr	26.38	83.6	5.26	10.20	6

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−3.24
	Mg	−25.9
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	No change
	Steel	Blue
	Cu	H etching
	Mg	H pitting

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	6 hr
100°F vis	8 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 227-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-62-16 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.84		4.45	0.22	
16 hr	16.60	−1.4	4.32	1.26	
24 hr	16.29	−3.3	4.29	1.40	
40 hr	16.08	−4.5	4.19	2.27	
48 hr	15.36	−8.8	3.91	6.42	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.04
	Ag	+0.02
	Steel	+0.02
	Cu	0.00
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	L blue
	Ti	Purple
	Ag	L brown
	Steel	Blue-green
	Cu	Brown-purple
	Mg	Yellow-green

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	M carbon

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 227-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-35 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.08		3.21	0.19	
16 hr	13.89	6.1	3.34	0.53	
24 hr	14.13	7.9	3.38	0.85	
40 hr	14.40	10.0	3.40	1.21	
48 hr	14.48	10.6	3.43	1.41	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	+0.06
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	No change
	Steel	Blue-brown
	Cu	Orange-green
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 227-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-61-11 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.67		4.11	0.39	
16 hr	15.74	+0.4	4.11	1.45	
24 hr	15.69	+0.1	4.10	1.63	
40 hr	15.44	−1.5	4.00	2.33	
48 hr	15.09	−3.7	3.80	8.39	3

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.04
Ti	0.00
Ag	+0.06
Steel	0.00
Cu	−0.08
Mg	−0.04

Metal discoloration, deposits, pitting, or etching:

Al	Peacock
Ti	Yellow-tan
Ag	Brown
Steel	Peacock
Cu	Brown
Mg	Yellow-purple

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	0.2
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	39 hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 227-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-63-16 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.47		4.34	0.29	
16 hr	16.29	−1.1	4.26	0.89	
24 hr	16.31	−1.0	4.24	1.20	
40 hr	16.02	−2.7	4.18	1.58	
48 hr	15.81	−4.0	4.12	1.99	2

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	+0.02
Steel	0.00
Cu	0.00
Mg	+0.02

Metal discoloration, deposits, pitting, or etching:

Al	L blue
Ti	Tan-blue
Ag	L brown
Steel	Blue-yellow
Cu	Orange-brown
Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 230-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-60-8 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.12	–	4.20	0.18	
16 hr	16.18	+0.4	4.21	0.79	
24 hr	16.04	−0.5	4.17	1.03	
40 hr	15.70	−2.6	3.95	5.90	
48 hr	17.16	+6.5	4.14	13.91	4

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−0.79
	Mg	−0.02
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Purple
	Ag	L yellow
	Steel	Blue-green
	Cu	M etching
	Mg	L pitting

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	0.2
Tube deposits:	Below oil level	None
	At and above oil level	M var

Breakpoint Data

Neut. no.	28 hr
100°F vis	44 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 230-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-60-18 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.13	–	3.17	0.19	
16 hr	13.00	7.2	3.34	1.05	
24 hr	13.20	8.8	3.36	1.31	
40 hr	12.98	7.0	3.33	1.88	
48 hr	12.85	5.9	3.30	2.13	2

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	+0.06
	Ag	+0.06
	Steel	+0.08
	Cu	−0.28
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Tan-brown
	Ag	L brown
	Steel	Blue
	Cu	L etching
	Mg	L gray

Test Cell Data

Sludge in oil:	200-mesh filter	0.9 g
	Centrifuge, vol %	0.2
Tube deposits:	Below oil level	H carbon
	At and above oil level	L carbon

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 230-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-62-3 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.51	–	3.84	0.02	
16 hr	15.76	+1.6	3.84	0.76	
24 hr	15.72	+1.4	3.84	1.00	
40 hr	15.57	+0.4	3.85	1.37	
48 hr	15.50	−0.1	3.77	1.54	,2

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	+0.02
	Steel	0.00
	Cu	−0.14
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown-purple
	Ag	L yellow
	Steel	Blue
	Cu	Purple-brown
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 230-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-62-4 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.01	–	3.93	0.11	
16 hr	15.28	1.8	3.96	1.53	
24 hr	15.23	1.5	3.94	1.62	
40 hr	15.13	0.8	3.92	1.77	
48 hr	15.09	0.5	3.82	1.91	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−0.10
	Mg	−0.77
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L tan
	Ag	Yellow
	Steel	Purple-blue
	Cu	Brown-green
	Mg	H pitting

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 230-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-62-6 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.79	–	4.70	0.24	
16 hr	17.40	-2.2	4.53	1.26	
24 hr	17.26	-3.0	4.49	1.51	
40 hr	16.78	-5.7	4.37	2.19	
48 hr	15.72	-11.6	4.02	5.30	3

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	+0.02
Steel	0.00
Cu	-0.22
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Purple-brown
Ag	L yellow
Steel	Blue
Cu	L etching
Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	40 hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 230-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-62-7 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.42	–	4.19	0.01	
16 hr	17.60	+1.0	4.19	0.68	
24 hr	17.56	+0.8	4.18	0.85	
40 hr	17.38	-0.2	4.14	1.12	
48 hr	17.28	-0.8	4.12	1.26	3

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	+0.02
Steel	0.00
Cu	0.00
Mg	+0.18

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Yellow-brown
Ag	Yellow
Steel	Blue
Cu	Purple-brown
Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 232-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-62-7 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.42	–	4.19	0.01	
16 hr	17.59	+1.0	4.20	0.61	
24 hr	17.59	+1.0	4.19	0.74	
40 hr	17.44	+0.1	4.14	0.98	
48 hr	17.38	−0.2	4.13	1.13	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	−0.02
	Steel	0.00
	Cu	−0.16
	Mg	+0.10
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L brown
	Ag	Yellow
	Steel	Blue
	Cu	Green-brown
	Mg	L gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L carbon

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 232-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-62-13 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.00	–	4.24	0.25	
16 hr	15.74	−1.6	4.13	1.28	
24 hr	15.62	−2.4	4.12	1.46	
40 hr	15.34	−4.1	4.03	2.05	
48 hr	15.12	−5.5	3.95	2.86	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−0.22
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	L blue
	Ti	Purple-tan
	Ag	L yellow
	Steel	Blue-green
	Cu	L pitting
	Mg	Yellow-brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	H carbon

Breakpoint Data

Neut. no	46 hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 232-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-63-1 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.48	-	4.64	0.23	
16 hr	17.24	−1.4	4.50	0.84	
24 hr	17.17	−1.8	4.49	1.04	
40 hr	16.72	−4.3	4.37	1.63	
48 hr	15.76	−9.8	4.09	3.78	2

Metal Specimen Data

Weight change, mg/cm²:

Al	−0.02
Ti	0.00
Ag	0.00
Steel	+0.02
Cu	−0.08
Mg	+0.10

Metal discoloration, deposits, pitting, or etching:

Al	L blue
Ti	Purple-tan
Ag	L yellow
Steel	Blue-green
Cu	Brown-orange
Mg	Yellow-brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	H carbon

Breakpoint Data

Neut. no.	40 hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 232-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-63-2 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.26	-	4.31	0.22	
16 hr	16.11	−0.9	4.25	0.92	
24 hr	16.07	−1.2	4.22	1.10	
40 hr	15.70	−3.4	4.12	1.60	
48 hr	15.06	−7.4	3.91	3.90	3

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	−0.02
Steel	0.00
Cu	−0.06
Mg	−0.14

Metal discoloration, deposits, pitting, or etching:

Al	L blue
Ti	Purple-tan
Ag	L yellow
Steel	Blue-green
Cu	Brown-orange
Mg	Yellow-brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	H carbon

Breakpoint Data

Neut. no.	43 hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 232-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-63-3 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.24	–	4.09	0.24	
16 hr	15.28	+0.3	3.99	1.24	
24 hr	15.25	+0.1	3.97	1.40	
40 hr	14.95	−1.9	3.90	2.09	
48 hr	15.64	+2.6	3.84	12.43	4

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−0.47
	Mg	−0.67
Metal discoloration, deposits, pitting, or etching:	Al	L blue
	Ti	Blue-green
	Ag	L yellow
	Steel	Blue-green
	Cu	L etching
	Mg	L pitting

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	H carbon

Breakpoint Data

Neut. no.	40 hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 232-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-63-8 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.77	–	3.50	0.15	
16 hr	14.51	5.4	3.63	0.88	
24 hr	14.57	5.8	3.63	1.07	
40 hr	14.60	6.0	3.64	1.45	
48 hr	14.71	6.8	3.65	1.63	2

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	−0.02
	Cu	−0.49
	Mg	−0.10
Metal discoloration, deposits, pitting, or etching:	Al	L blue
	Ti	Purple-tan
	Ag	L yellow
	Steel	Blue-purple
	Cu	L etching
	Mg	Brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	1.4
Tube deposits:	Below oil level	None
	At and above oil level	L carbon

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 237-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON F-1041 AT 600°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5	–	12.88	0.00	
16 hr	432.2	21.9	14.13	0.08	
24 hr	515.7	45.5	15.27	0.19	
40 hr	851.0	140	19.38	0.31	
48 hr	1231.5	247	23.16	0.34	8

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	0.00	0.00
	Ti	0.00	0.00
	Ag	0.00	−0.02
	Steel	+0.02	−0.08
	S. S.	0.00	0.00
	Cu	–	–
	Mg	–	–
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	
	Ti	Blue-green	
	Ag	L brown	
	Steel	Dark gray	
	S. S.	Blue-green	
	Cu	–	
	Mg	–	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	Very L var

Test Conditions	
Sample temperature, °F	600
Sample volume, ml	250
Air rate, liter/hr	20
Condensate return	No

TEST NO. 237-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON F-1041 AT 600°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5	–	12.88	0.00	
16 hr	415.6	17.2	13.92	0.07	
24 hr	460.6	29.9	14.52	0.09	
40 hr	556.2	56.9	15.86	0.13	
48 hr	617.6	74.2	16.65	0.16	10

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	−0.02	−0.02
	Ti	0.00	0.00
	Ag	−0.08	−0.16
	Steel	+0.02	−0.12
	S. S.	0.00	0.00
	Cu	+0.20	−0.95
	Mg	+0.57	+0.14
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	
	Ti	L brown	
	Ag	L brown	
	Steel	Dark gray	
	S. S.	Brown-purple	
	Cu	Dark brown	
	Mg	Gray	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	Very L var

Test Conditions	
Sample temperature, °F	600
Sample volume, ml	250
Air rate, liter/hr	20
Condensate return	No

TEST NO. 237-3. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON K-1051 AT 600°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	390.6	–	13.33	0.00	
16 hr	482.2	23.5	14.65	0.06	
24 hr	534.2	36.8	15.28	0.07	
40 hr	650.5	66.5	16.67	0.11	
48 hr	725.1	85.6	17.59	0.13	7

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	−0.02	−0.04
	Ti	0.00	−0.02
	Ag	−0.06	−0.14
	Steel	+0.04	−0.16
	S. S.	0.00	−0.02
	Cu	+0.43	+0.04
	Mg	+1.24	+0.39
Metal discoloration, deposits, pitting, or etching:	Al	No change	
	Ti	L brown	
	Ag	L brown	
	Steel	Dark gray	
	S. S.	Brown-purple	
	Cu	Dark brown	
	Mg	Purple	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	Very L var

Test Conditions	
Sample temperature, °F	600
Sample volume, ml	250
Air rate, liter/hr	20
Condensate return	No

TEST NO. 237-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-66-10 AT 600°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	348.0	–	12.90	0.00	
16 hr	377.2	8.4	13.32	0.06	
24 hr	382.7	10.0	13.43	0.05	
40 hr	389.6	12.0	13.51	0.03	
48 hr	396.6	14.0	13.63	0.05	8

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	0.00	−0.02
	Ti	0.00	−0.02
	Ag	0.00	0.00
	Steel	+0.04	0.00
	S. S.	0.00	0.00
	Cu	–	–
	Mg	–	–
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	
	Ti	L brown	
	Ag	L yellow	
	Steel	Dark gray	
	S. S.	L brown	
	Cu	–	
	Mg	–	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	Very L var

Test Conditions	
Sample temperature, °F	600
Sample volume, ml	250
Air rate, liter/hr	20
Condensate return	No

TEST NO. 237-5. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-66-26 AT 600°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	274.5	–	26.32	(a)	
16 hr	282.9	3.1	26.83	–	
24 hr	286.9	4.5	27.19	–	
40 hr	295.9	7.8	28.01	–	
48 hr	330.0	20.2	28.43	–	12

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	+0.12	+0.04
	Ti	−1.26	−1.91
	Ag	0.51	−0.51
	Steel	+0.93	−1.09
	S. S.	+0.08	+0.04
	Cu	–	–
	Mg	–	–
Metal discoloration, deposits, pitting, or etching:	Al	L gray	
	Ti	M etching	
	Ag	L pitting	
	Steel	Dark gray	
	S. S.	Dark gray	
	Cu	–	
	Mg	–	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	Thin
	At and above oil level	White sludge

Test Conditions	
Sample temperature, °F	600
Sample volume, ml	250
Air rate, liter/hr	20
Condensate return	No

(a) Sample insoluble in titration solvent.

TEST NO. 238-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON F-1041 AT 650°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5		12.88	0.00	
16 hr	1795	406	26.71	0.38	
24 hr	(a)	–	54.58	0.48	
40 hr	(a)	–	1556	0.70	13

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	+0.04	0.00
	Ti	0.00	0.00
	Ag	+0.71	+0.30
	Steel	+0.12	−1.25
	S. S.	+0.08	0.00
	Cu	–	–
	Mg	–	–
Metal discoloration, deposits, pitting, or etching:	Al	L brown	
	Ti	Blue	
	Ag	Brown	
	Steel	Brown	
	S. S.	Peacock	
	Cu	–	
	Mg	–	

Test Cell Data		
Sludge in oil.	200-mesh filter	None
	Centrifuge, vol %	(a)
Tube deposits:	Below oil level	None
	At and above oil level	M var

Test Conditions	
Sample temperature, °F	650
Sample volume, ml	250
Air rate, liter/hr	20
Condensate return	No

(a) Sample too thick for analysis–test terminated at 40 hr.

TEST NO. 238-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON F-1041 AT 650°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5	-	12.88	0.00	
16 hr	1103	211	21.46	0.15	
24 hr	(a)	-	30.61	0.19	
40 hr	(a)	-	96.36	0.33	7

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	0.00	0.00
	Ti	0.00	0.00
	Ag	-0.32	-0.32
	Steel	+0.12	-4.70
	S. S.	+0.04	0.00
	Cu	0.00	-1.42
	Mg	+0.26	+0.10
Metal discoloration, deposits, pitting, or etching:	Al	No change	
	Ti	Purple	
	Ag	L pitting	
	Steel	Brown	
	S. S.	Blue-brown	
	Cu	Orange-brown	
	Mg	Brown	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	(a)
Tube deposits:	Below oil level	None
	At and above oil level	M var

Test Conditions	
Sample temperature, °F	650
Sample volume, ml	250
Air rate, liter/hr	20
Condensate return	No

(a) Sample too thick for analysis – test terminated at 40 hr.

TEST NO. 238-3. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-66-10 AT 650°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	348.0		12.90	0.00	
16 hr	404.6	16.3	13.71	0.00	
24 hr	426.6	22.6	14.06	0.00	
40 hr	474.8	36.4	14.71	0.02	
48 hr	506.6	45.6	15.13	0.05	6

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	0.00	0.00
	Ti	0.00	0.00
	Ag	-0.12	-0.12
	Steel	+0.12	-1.64
	S. S.	+0.02	0.00
	Cu		
	Mg		
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	
	Ti	L brown	
	Ag	Yellow	
	Steel	L blue	
	S. S.	L brown	
	Cu		
	Mg		

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions	
Sample temperature, °F	650
Sample volume, ml	250
Air rate, liter/hr	20
Condensate return	No

TEST NO. 238-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-66-10 AT 650°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	348.0	–	12.90	0.00	
16 hr	405.6	16.6	13.73	0.02	
24 hr	426.9	22.7	14.05	0.02	
40 hr	472.2	35.7	14.69	0.04	
48 hr	502.8	44.5	15.14	0.06	12

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	0.00	0.00
	Ti	0.00	0.00
	Ag	−0.10	−0.10
	Steel	+0.14	−0.59
	S. S.	+0.02	0.00
	Cu	+0.08	−0.31
	Mg	+0.22	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	
	Ti	L brown	
	Ag	Yellow	
	Steel	L blue	
	S. S.	L brown	
	Cu	Orange-brown	
	Mg	Brown	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions	
Sample temperature, °F	650
Sample volume, ml	250
Air rate, liter/hr	20
Condensate return	No

TEST NO. 241-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-14 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.66	–	4.65	0.26	
7 days	17.47	−1.1	4.55	1.47	
14 days	32.17	+82.2	6.44	43.5	
21 days	–	–	–	72.6	
26 days	–	–	–	–	30[a]

Metal Specimen Data		
Weight change, mg/cm²:	Al	+0.04
	Ti	+0.04
	Ag	0.00
	Steel	+0.06
	Cu	−1.80
	Mg	−0.02
Metal discoloration, deposits, pitting, or etching:	Al	Yellow
	Ti	Brown-purple
	Ag	Yellow-purple
	Steel	Blue-purple
	Cu	Etched
	Mg	Large pit

Test Cell Data		
Sludge in oil:	200-mesh filter	(a)
	Centrifuge, vol %	(a)
Tube deposits:	Below oil level	H var & carbon
	At and above oil level	Yellowish-white crystals

Breakpoint Data	
Neut. no.	5 days
100°F vis	8 days

Test Conditions	
Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

No oil makeup for samples taken.

(a) Test terminated after 21 days–sample solidified.

TEST NO. 241-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-14 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.66	–	4.65	0.26	
7 days	17.41	−1.4	4.53	1.44	
14 days	15.78	−10.6	4.01	6.11	
21 days	12,185	+68,898	278	60.6	
26 days	(a)	–	–	61.9	21

Metal Specimen Data

Weight change, mg/cm²	Al	0.00
	Ti	+0.02
	Ag	0.00
	Steel	0.00
	Cu	−1.87
	Mg	−1.91
Metal discoloration, deposits, pitting, or etching:	Al	Yellow
	Ti	Brown-purple
	Ag	Yellow-purple
	Steel	Blue-purple
	Cu	Etched
	Mg	Large pits

(a) Solidified sample.

Test Cell Data

Sludge in oil:	200-mesh filter	(a)
	Centrifuge, vol %	(a)
Tube deposits:	Below oil level	H var & carbon
	At and above oil level	Yellowish-white crystals

Breakpoint Data

Neut. no.	6 days
100°F vis	17 days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 241-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-19 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.72	–	4.67	0.25	
7 days	17.34	−2.1	4.52	1.41	
14 days	16.64	−6.1	4.35	2.00	
21 days	64.96	+267	11.38	44.1	
26 days	(a)	–	–	54.1	20

Metal Specimen Data

Weight change, mg/cm²	Al	−0.02
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−2.86
	Mg	−0.06
Metal discoloration, deposits, pitting, or etching:	Al	Yellow
	Ti	Blue-yellow
	Ag	Yellow
	Steel	Brown-yellow-blue
	Cu	Etched
	Mg	Small pit

(a) Solidified sample.

Test Cell Data

Sludge in oil:	200-mesh filter	–
	Centrifuge, vol %	–
Tube deposits:	Below oil level	H var & carbon
	At and above oil level	Yellowish-white crystals

Breakpoint Data

Neut. no.	14 days
100°F vis	15 days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 241-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-21 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.11	–	3.76	0.07	
7 days	15.40	1.9	3.78	1.22	
14 days	15.33	1.5	3.74	1.82	
21 days	15.59	3.2	3.71	3.60	
26 days	17.80	17.8	4.05	9.78	11

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−0.22
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	L pale blue
	Ti	Blue-green
	Ag	L tan
	Steel	L pale green
	Cu	Brownish-red
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	None

Breakpoint Data

Neut. no.	18 days
100°F vis	23 days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 241-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-31 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.40	–	3.23	0.08	
7 days	14.75	10.1	3.45	0.54	
14 days	15.11	12.8	3.52	0.73	
21 days	15.45	15.3	3.57	0.80	
26 days	15.59	16.3	3.59	0.85	12

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	+0.22
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	L tan
	Steel	Brown-purple
	Cu	L etching
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 241-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-25 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.64	--	3.31	0.10	
7 days	16.35	19.9	3.73	1.10	
14 days	17.23	26.3	3.78	1.66	
21 days	20.36	49.3	4.33	4.54	
26 days	23.39	71.5	4.79	5.69	12

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	-1.20
	Steel	0.00
	Cu	-69.9
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	Charcoal gray
	Steel	Blue
	Cu	H etching
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	H var & carbon
	At and above oil level	None

Breakpoint Data

Neut. no.	14 days
100°F vis	16 days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 248-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-18 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.55	--	4.61	0.21	
7 days	17.48	-0.4	4.57	1.41	
14 days	16.92	-3.6	4.45	2.22	
21 days	19.79	+12.8	4.52	25.4	
26 days	(a)	--	52.74	53.0	21

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	-0.10
	Steel	+0.04
	Cu	-0.51
	Mg	-0.95
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L green
	Ag	Yellow
	Steel	Brown-green
	Cu	L etching
	Mg	Large pits

Test Cell Data

Sludge in oil:	200-mesh filter	--
	Centrifuge, vol %	--
Tube deposits:	Below oil level	H var & carbon
	At and above oil level	None
	White crystalline deposits in condenser	

Breakpoint Data

Neut. no.	14 days
100°F vis	16 days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Sample semisolid.

TEST NO. 248-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-18 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.55	–	4.61	0.21	
7 days	17.35	-1.1	4.54	1.28	
14 days	16.97	-3.3	4.40	2.24	
21 days	16.32	-7.0	4.02	13.35	
26 days	(a)	–	77.88	53.4	17

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	-0.04
	Steel	+0.02
	Cu	-1.16
	Mg	–
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L green
	Ag	Yellow
	Steel	Brown-green
	Cu	Etched
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	(a)
	Centrifuge, vol %	(a)
Tube deposits:	Below oil level	H var & carbon
	At and above oil level	None

Breakpoint Data

Neut. no.	17 days
100°F vis	23 days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Sample semisolid.

TEST NO. 248-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-19 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.72	–	4.67	0.25	
7 days	17.46	-1.5	4.55	1.37	
14 days	16.78	-5.3	4.38	2.46	
21 days	18.93	+6.8	4.39	23.7	
26 days	(a)	–	88.56	52.4	19

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.04
	Ag	-0.08
	Steel	+0.02
	Cu	-2.27
	Mg	+0.08
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L yellow-blue
	Ag	Yellow
	Steel	Brown-green
	Cu	Etched
	Mg	L yellow-green

Test Cell Data

Sludge in oil:	200-mesh filter	–
	Centrifuge, vol %	–
Tube deposits:	Below oil level	H var & carbon
	At and above oil level	None
	White crystalline deposits in condenser	

Breakpoint Data

Neut. no.	13 days
100°F vis	19 days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Sample semisolidified.

TEST NO. 248-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-21 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.11	-	3.76	0.07	
7 days	15.49	2.5	3.82	0.96	
14 days	15.37	1.7	3.79	1.75	
21 days	15.48	2.4	2.76	2.10	
26 days	15.56	3.0	3.80	2.38	9

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	−0.08
	Steel	+0.02
	Cu	-
	Mg	-
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Pale blue
	Ag	Tan
	Steel	Brown-green
	Cu	-
	Mg	-

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	M & H var
	At and above oil level	None

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 248-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-25 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.64		3.31	0.10	
7 days	15.83	16.1	3.65	1.47	
14 days	18.60	36.7	4.09	3.35	
21 days	22.94	68.2	4.74	6.73	
26 days	25.47	86.7	5.11	7.87	12

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	−1.72
	Steel	0.00
	Cu	−112
	Mg	-
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	Brown
	Steel	Blue
	Cu	Etched
	Mg	-

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	11 days
100°F vis	9 days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 243-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-25 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.64	–	3.31	0.10	
7 days	15.27	12.0	3.56	1.16	
14 days	15.81	15.9	3.69	1.91	
21 days	16.14	18.3	3.73	2.10	
26 days	16.17	18.5	3.71	1.91	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	−0.57
	Steel	+0.02
	Cu	–
	Mg	–
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	Blue
	Steel	Blue
	Cu	–
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 253-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-25 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.64	–	3.31	0.10	
16 hr	14.85	8.9	3.49	1.52	
24 hr	15.15	11.1	3.54	1.66	
40 hr	15.63	14.6	3.62	2.17	
48 hr	15.99	17.2	3.68	2.73	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−1.74
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	Brown
	Steel	Blue-purple
	Cu	L brown-orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 253-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-2 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.40	–	3.57	0.21	
16 hr	14.38	−0.1	3.52	0.45	
24 hr	14.41	+0.1	3.52	0.57	
40 hr	14.37	−0.2	3.50	0.82	
48 hr	14.41	+0.1	3.50	0.94	2

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	−0.02
	Mg	−0.10
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L yellow
	Steel	Green-blue
	Cu	L brown-orange
	Mg	White

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 253-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-3 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.77	–	3.13	0.24	
16 hr	13.47	5.5	3.24	0.63	
24 hr	13.64	6.8	3.27	0.84	
40 hr	13.79	8.0	3.30	1.22	
48 hr	13.90	8.8	3.31	1.36	1

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	+0.06
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L yellow
	Steel	Purple-blue
	Cu	Brown-orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 253-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-66-25 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample Acidity, mg KOH/g	Overhead Sample Vis, cs/100°F
Initial	13.64	–	3.31	0.10	–			
16 hr	20.71	51.8	4.33	1.36	48.5			
24 hr	24.15	77.1	4.77	1.59	59.7			
40 hr	31.30	129	5.64	1.90	67.7			
48 hr	35.02	157	6.11	2.09	68.5	51	4.49	7.66

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	0.00
Steel	0.00
Cu	-0.53
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	Brown
Steel	Blue-purple
Cu	L brown-orange
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 253-5. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-67-2 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample Acidity, mg KOH/g	Overhead Sample Vis, cs/100°F
Initial	14.40	–	3.57	0.21	–			
16 hr	15.52	7.8	3.74	0.28	29.9			
24 hr	16.39	13.8	3.86	0.34	42.2			
40 hr	18.18	26.2	4.16	0.55	61.1			
48 hr	19.36	34.4	4.36	0.63	67.0	40	1.33	10.11

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	0.00
Steel	0.00
Cu	-0.10
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	L yellow
Steel	Blue
Cu	Pink-orange
Mg	White

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 253-6. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-67-3 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	12.77	–	3.13	0.24	–			
16 hr	15.87	24.3	3.60	0.40	38.7			
24 hr	16.86	32.0	3.75	0.59	47.9			
40 hr	18.70	46.4	4.00	0.90	60.9			
48 hr	19.73	54.5	4.18	1.05	64.6	42	2.10	8.62

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	0.00
Steel	0.00
Cu	−0.04
Mg	+0.26

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	L yellow
Steel	Green-blue
Cu	Brown-orange
Mg	Gray deposit

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 255-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-64-12 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	13.79	–	3.52	0.25	–			
16 hr	15.37	11.5	3.81	1.26	17.2			
24 hr	15.57	12.9	3.84	1.31	24.5			
40 hr	15.74	14.1	3.88	1.35	37.9			
48 hr	15.75	14.2	3.85	1.48	44.3	30	4.29	12.01

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.18
Ti	+0.14
Ag	+0.20
Steel	+0.20
Cu	−0.01
Mg	+0.26

Metal discoloration, deposits, pitting, or etching:

Al	Brown
Ti	Brown
Ag	Brown
Steel	Brown
Cu	Brown-orange
Mg	Brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	2.8
Tube deposits:	Below oil level	H var
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 255-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-64-18 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	16.84	--	4.29	0.11	--			
16 hr	18.24	8.3	4.56	1.19	23.2			
24 hr	18.79	11.6	4.68	1.37	32.8			
40 hr	20.21	20.2	4.98	1.80	50.1			
48 hr	21.42	27.2	5.21	2.58	57.9	35	4.24	11.23

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	-0.02
Ag	0.00
Steel	+0.02
Cu	-0.04
Mg	-0.04

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Blue
Ag	No change
Steel	Blue-green
Cu	Brown
Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 255-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-14 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.71	--	4.67	0.24	
16 hr	17.12	-3.3	4.46	1.60	
24 hr	17.04	-3.8	4.44	1.92	
40 hr	16.48	-6.0	4.30	2.52	
48 hr	16.25	-8.2	4.01	11.90	4

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	-0.02
Steel	0.00
Cu	-0.28
Mg	-0.24

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L blue
Ag	L pink-yellow
Steel	Blue-green
Cu	Brown-orange
Mg	L pitting

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	H var & carbon
	At and above oil level	None

Breakpoint Data

Neut. no.	4[illegible] hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 255-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-20 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.75	–	4.68	0.26	
16 hr	17.04	−4.0	4.44	1.62	
24 hr	16.89	−4.8	4.39	1.94	
40 hr	16.37	−7.8	4.25	2.58	
48 hr	15.80	−11.0	3.94	10.47	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−0.34
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Purple
	Ag	L pink-yellow
	Steel	Blue-green
	Cu	Brown-orange
	Mg	L pitting

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	H var & carbon
	At and above oil level	None

Breakpoint Data

Neut. no.	40 hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 255-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-5 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.04	–	3.75	0.05	
16 hr	14.92	−0.8	3.68	1.23	
24 hr	14.91	−0.9	3.67	1.53	
40 hr	14.79	−1.7	3.63	1.56	
48 hr	14.70	−2.3	3.62	1.84	7

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	−0.02
	Steel	0.00
	Cu	−0.12
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown
	Ag	Yellow
	Steel	Blue
	Cu	Brown-orange
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 255-6. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-66-5 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.04	-	3.75	0.05				
16 hr	16.96	12.8	4.05	1.12	33.9			
24 hr	18.34	21.9	4.28	1.12	47.8			
40 hr	22.62	50.4	4.96	1.29	67.8			
48 hr	25.64	70.5	5.44	1.53	72.5	45	1.53	9.08

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	0.00
	Ag	−0.02
	Steel	0.00
	Cu	−0.18
	Mg	+0.55
Metal discoloration, deposits, pitting, or etching:	Al	L. yellow
	Ti	L. brown
	Ag	L. yellow
	Steel	Blue
	Cu	Brown-green
	Mg	Gray deposit

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 261-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-31 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.40		3.23	0.08	
7 days	14.75	10.1	3.46	0.62	
14 days	15.24	13.7	3.53	0.83	
21 days	15.64	16.7	3.61	0.94	
26 days	15.81	18.0	3.62	0.91	15

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	−0.02
	Ag	−0.08
	Steel	+0.04
	Cu	+0.18
	Mg	−0.02
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L. brown
	Ag	No change
	Steel	Red-brown
	Cu	Red-brown
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 261-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-21 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.11	–	3.76	0.07	
7 days	15.42	2.1	3.79	1.32	
14 days	15.46	2.3	3.80	1.97	
21 days	15.60	3.2	3.77	2.28	
26 days	15.82	4.7	3.81	2.46	11

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	−0.02
	Ag	−0.02
	Steel	0.00
	Cu	−0.22
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	L pale blue
	Ti	Blue
	Ag	L orange & yellow
	Steel	Pale green
	Cu	Purple, brown & orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 261-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-25 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.64		3.31	0.10	
7 days	15.34	12.5	3.59	1.30	
14 days	15.88	16.4	3.66	1.57	
21 days	16.18	18.6	3.71	1.64	
26 days	16.22	18.9	3.72	1.65	30

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	−0.51
	Steel	0.00
	Cu	+0.04
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L etching
	Steel	Blue
	Cu	Yellow
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 261-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-19 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.72	–	4.67	0.25	
7 days	17.69	−0.2	4.63	1.28	
14 days	17.29	−2.4	4.51	1.76	
21 days	16.89	−4.7	4.41	2.27	
26 days	16.87	−4.8	4.40	2.32	8

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	0.00
Ag	−0.10
Steel	+0.02
Cu	–
Mg	–

Metal discoloration, deposits, pitting, or etching:

Al	L pale blue
Ti	Blue
Ag	Brown
Steel	Blue, green, & yellow
Cu	–
Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 261-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-19 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.72	–	4.67	0.25	
7 days	17.80	+0.5	4.66	1.27	
14 days	17.38	−1.9	4.56	1.75	
21 days	17.06	−3.7	4.46	2.03	
26 days	16.99	−4.1	4.44	2.33	10

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	−0.02
Ag	−0.08
Steel	0.00
Cu	+0.08
Mg	+0.10

Metal discoloration, deposits, pitting, or etching:

Al	L pale blue
Ti	Blue
Ag	Brown
Steel	Blue, green, & brown
Cu	Yellow
Mg	Gray, yellow, & pink

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 261-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-2 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	27.50		5.08	0.07	
7 days	31.24	13.6	5.50	0.34	
14 days	32.05	16.5	5.60	0.38	
21 days	32.68	18.8	5.68	0.46	
26 days	32.87	19.5	5.71	0.51	7

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	−0.02
	Ag	−0.08
	Steel	0.00
	Cu	−0.04
	Mg	+0.75
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	Yellow
	Steel	Blue, green, & yellow
	Cu	Yellow & orange
	Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 268-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-8 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.24		3.26	0.23	
16 hr	14.29	7.9	3.44	1.02	
24 hr	14.42	8.9	3.46	1.19	
40 hr	14.71	11.1	3.51	1.44	
48 hr	14.82	11.9	3.53	1.57	4

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	0.00
	Steel	−0.02
	Cu	−0.24
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L yellow
	Steel	Purple-blue
	Cu	L etching
	Mg	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 268-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.87	–	3.69	0.04	
16 hr	15.04	+1.1	3.74	0.72	
24 hr	15.01	+0.9	3.70	0.85	
40 hr	14.85	−0.1	3.67	1.08	
48 hr	14.79	−0.5	3.66	1.36	3

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	0.00
Ag	0.00
Steel	+0.02
Cu	−0.15
Mg	+0.06

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Brown-yellow
Ag	Yellow
Steel	Blue
Cu	Brown-purple-green
Mg	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	M var
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 268-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-11 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.26	–	3.21	0.05	
16 hr	13.96	5.3	3.33	0.48	
24 hr	14.15	6.7	3.36	0.63	
40 hr	14.32	8.0	3.41	0.94	
48 hr	14.49	9.3	3.42	1.11	3

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	0.00
Steel	−0.02
Cu	−0.04
Mg	+0.02

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	L yellow
Steel	Blue
Cu	Yellow-orange
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 268-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-67-8 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	13.24	-	3.26	0.23	–			
16 hr	15.44	6.6	3.65	0.80	39.5			
24 hr	16.60	25.4	3.85	0.92	55.1			
40 hr	20.53	55.0	4.47	1.30	77.4			
48 hr	25.29	91.0	5.16	1.56	83.1	54	1.92	10.76

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	-0.02
Steel	0.00
Cu	-0.41
Mg	+0.02

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	L yellow
Steel	Purple-blue
Cu	L etching
Mg	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 268-5. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	14.87	–	3.69	0.04	–			
16 hr	17.13	15.2	4.10	0.52	37.4			
24 hr	18.82	26.6	4.39	0.58	52.3			
40 hr	23.52	58.2	5.15	0.85	72.3			
48 hr	26.92	81.0	5.69	1.11	76.3	47	1.33	9.17

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	0.00
Ag	0.00
Steel	0.00
Cu	-0.19
Mg	+0.06

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Brown-yellow
Ag	Yellow
Steel	Blue
Cu	Purple-dark brown
Mg	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	Very L var

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 268-6. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-67-11 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	13.26	–	3.21	0.05	–			
16 hr	16.22	22.3	3.67	0.38	42.8			
24 hr	18.50	39.5	3.99	0.52	60.2			
40 hr	27.13	105	5.10	0.82	82.4			
48 hr	35.64	169	6.05	0.88	85.6	53	1.33	9.28

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	−0.02
Steel	−0.02
Cu	0.00
Mg	+0.02

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	L yellow
Steel	Blue
Cu	Orange-yellow
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 269-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-4 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	29.19	–	5.41	0.10	
16 hr	31.11	6.6	5.63	0.41	
24 hr	31.57	8.2	5.69	0.45	
40 hr	32.22	10.4	5.75	0.53	
48 hr	32.69	12.0	5.81	0.57	4

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	0.00
Steel	+0.02
Cu	−0.41
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Tan
Ag	No change
Steel	Blue-purple
Cu	L etching
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 269-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-5 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.63	–	3.30	0.22	
16 hr	14.37	5.4	3.41	0.49	
24 hr	14.57	6.9	3.45	0.67	
40 hr	14.71	7.9	3.46	0.93	
48 hr	14.87	9.1	3.49	1.09	0

Metal Specimen Data

Weight change, mg/cm²:

Al	−0.02
Ti	0.00
Ag	0.00
Steel	+0.02
Cu	+0.08
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Tan
Ag	Yellow
Steel	Purple-blue
Cu	Orange-brown
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 269-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-7 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.34		4.58	0.26	
16 hr	16.99	−2.0	4.45	0.91	
24 hr	16.84	−2.9	4.41	1.12	
40 hr	16.19	−6.6	4.24	1.85	
48 hr	15.32	−11.6	3.90	6.65	2

Metal Specimen Data

Weight change, mg/cm²:

Al	−0.02
Ti	0.00
Ag	0.00
Steel	0.00
Cu	−0.02
Mg	+0.02

Metal discoloration, deposits, pitting, or etching:

Al	Tan
Ti	Brown-purple
Ag	Pink-yellow
Steel	Blue-green
Cu	Orange-pink-green
Mg	L brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits.	Below oil level	L var
	At and above oil level	None

Breakpoint Data

Neut. no.	39 hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 269-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-67-4 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	29.19	–	5.41	0.10	–			
16 hr	31.83	9.0	5.71	0.31	0.9			
24 hr	32.52	11.4	5.80	0.42	1.3			
40 hr	33.75	15.6	5.94	0.53	2.2			
48 hr	34.69	18.8	6.05	0.62	2.5	10	10.70	20.49

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−0.71
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Tan
	Ag	No change
	Steel	Blue-purple
	Cu	L etching
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 269-5. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-67-5 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	13.63	–	3.30	0.22	–			
16 hr	15.70	15.2	3.61	0.31	33.6			
24 hr	16.90	24.0	3.84	0.44	46.4			
40 hr	19.99	46.7	4.36	0.73	64.2			
48 hr	22.51	65.1	4.59	0.80	67.9	47	1.56	10.36

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	−0.06
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Tan
	Ag	Yellow
	Steel	Brown-purple
	Cu	Orange-pink
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 269-6. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-67-7 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	17.34	–	4.58	0.26				
16 hr	19.32	11.4	5.02	0.67	37.4			
24 hr	21.08	21.6	5.43	0.73	54.8			
40 hr	29.23	68.6	7.21	1.16	86.9			
48 hr	47.31	173	10.97	1.68	97.1	59	1.59	10.82

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	0.00
	Ag	+0.02
	Steel	+0.02
	Cu	+0.06
	Mg	+0.12
Metal discoloration, deposits, pitting, or etching:	Al	Tan
	Ti	Brown
	Ag	Pink-yellow
	Steel	Blue-green
	Cu	Orange, pink & green
	Mg	L brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 271-1. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON ATL-652 AT 425°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.65	–	3.54	0.19				
18 hr	31.13	98.9	5.50	5.97	73.2	40	17.46	11.19

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	0.00
	Steel	0.00
	S. S.	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L yellow
	Steel	Blue-green
	S. S.	Purple

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	0.6
Tube deposits:	Below oil level	L var
	At and above oil level	None

Test Conditions

Sample temperature, °F	425
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 271-2. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON ATL-652 AT 425°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	15.65		3.54	0.19				
18 hr	33.70	115	5.78	7.21	75.3	42	15.54	11.56

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.02
Ag	0.00
Steel	0.00
S. S.	0.00

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	L yellow
Steel	Blue-green
S. S.	Purple

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	0.6
Tube deposits:	Below oil level	L var
	At and above oil level	None

Test Conditions

Sample temperature, °F	425
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 272-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON F-1041 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5		12.88	0.00	
16 hr	472.8	33.4	14.70	0.18	
24 hr	605.8	70.9	16.52	0.22	
40 hr	1171	230	22.47	0.35	
48 hr	1666	370	27.00	0.42	1

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.04
Ag	+0.08
Steel	+0.08
Cu	0.59
Mg	+0.43

Metal discoloration, deposits, pitting, or etching:

Al	Yellow
Ti	Red-brown
Ag	White-brown
Steel	Gray
Cu	Grange-gray
Mg	Gray-brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	M var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 272-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-20 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	24.22		4.07	0.00	
16 hr	27.31	12.8	4.38	0.13	
24 hr	27.62	14.0	4.42	0.06	
40 hr	28.58	18.0	4.51	0.07	
48 hr	28.48	17.6	4.51	0.04	2

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.20
Ti	+0.22
Ag	0.00
Steel	+0.43
Cu	-5.60
Mg	+1.00

Metal discoloration, deposits, pitting, or etching:

Al	L brown spots
Ti	Tan-purple
Ag	L brown
Steel	Tan
Cu	Etching and pitting
Mg	D gray

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	0.4
Tube deposits:	Below oil level	L carbo
	At and above oil level	L carbo

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 272-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6		13.02	0.01	
16 hr	388.9	8.8	13.48	0.08	
24 hr	394.9	10.4	13.58	0.04	
40 hr	406.2	13.6	13.77	0.04	
48 hr	413.5	15.6	13.87	0.07	3

Metal Specimen Data

Weight change, mg/cm²:

Al	-0.02
Ti	+0.02
Ag	0.00
Steel	+0.08
Cu	-0.06
Mg	+0.08

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Yellow-brown
Ag	Yellow
Steel	Green-purple
Cu	Orange-brown
Mg	Brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	Very L var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 272-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON F-1041 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5	–	12.88	0.00	
16 hr	460.6	29.9	14.54	0.17	
24 hr	574.3	62.0	16.06	0.23	
40 hr	981.3	177	20.64	0.26	
48 hr	1311	270	23.83	0.38	3

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.04
Ag	−0.34
Steel	+0.08
Cu	−1.07
Mg	–

Metal discoloration, deposits, pitting, or etching:

Al	Yellow
Ti	Red-brown
Ag	White
Steel	Gray
Cu	Orange-green
Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	M var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 272-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-20 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	24.22	–	4.07	0.00	
16 hr	27.11	11.9	4.37	0.10	
24 hr	27.51	13.6	4.40	0.07	
40 hr	28.44	17.4	4.49	0.05	
48 hr	28.45	17.5	4.50	0.08	1

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.24
Ti	+0.20
Ag	0.00
Steel	+0.36
Cu	−6.25
Mg	–

Metal discoloration, deposits, pitting, or etching:

Al	L brown spots
Ti	Brown-purple
Ag	L brown
Steel	Tan
Cu	Etching and pitting
Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	0.4
Tube deposits:	Below oil level	L carbon
	At and above oil level	L carbon

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 272-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6	–	13.02	0.01	
16 hr	387.4	8.3	13.44	0.08	
24 hr	394.6	10.3	13.59	0.08	
40 hr	406.8	13.8	13.77	0.08	
48 hr	412.6	15.4	13.88	0.06	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	0.00
	Steel	-0.06
	Cu	-0.16
	Mg	–
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Yellow-brown
	Ag	Yellow
	Steel	Green-purple
	Cu	Orange-brown
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	Very L var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 272-7. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON F-1041 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5	–	12.88	0.00	
16 hr	404.7	14.2	13.69	0.02	
24 hr	454.3	28.2	14.37	0.02	
40 hr	(a)	–	–	–	78

Metal Specimen Data

Weight change, mg/cm₂:	Al	+0.02
	Ti	+0.06
	Ag	0.00
	Steel	+0.10
	S. S.	+0.02
	Cu	+0.14
Metal discoloration, deposits pitting, or etching:	Al	Gray
	Ti	Yellow-brown
	Ag	L brown-white
	Steel	Gray
	S. S.	Tan-pink
	Cu	Dark gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Sample test cell dry at 40 hours.

TEST NO. 272-8. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6		13.02	0.01	
16 hr	399.9	11.8	13.60	0.09	
24 hr	440.6	23.2	14.24	0.10	
40 hr	(a)				77

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.06
	Ag	0.00
	Steel	+0.12
	S. S.	+0.02
	Cu	+0.10
Metal discoloration, deposits pitting, or etching:	Al	L yellow
	Ti	Yellow-brown
	Ag	Yellow
	Steel	Brown-green-purple
	S. S.	L brown-purple-pink
	Cu	Orange-gray-brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	M var
	At and above oil level	M var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Sample test cell dry at 40 hours.

TEST NO. 273-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON F-1041 AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5		12.88	0.00	
16 hr	1,043	194	20.98	0.33	
24 hr	2,331	558	30.50	0.30	
40 hr	18,745	5188	79.46	0.45	
48 hr	(a)		171.4	0.30	2

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	-0.55
	Steel	0.00
	Cu	-1.10
	Mg	+1.48
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Blue
	Ag	L etching
	Steel	Black
	Cu	Brown-orange
	Mg	Dark gray spots

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	M var

Test Conditions

Sample temperature, °F	644
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Sample semisolidified at 100°F.

TEST NO. 273-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-20 AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	24.22		4.07	0.00	
16 hr	29.52	21.9	4.57	0.01	
24 hr	30.97	27.9	4.69	0.05	
40 hr	34.16	41.0	4.99	0.07	
48 hr	35.19	45.3	5.09	0.10	1

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.10
	Ti	0.00
	Ag	-1.42
	Steel	+0.10
	Cu	-7.60
	Mg	+0.53
Metal discoloration, deposits, pitting, or etching:	Al	L tan
	Ti	Brown-blue
	Ag	L etching
	Steel	Green-purple
	Cu	M etching
	Mg	Dark gray deposits

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var & carbon

Test Conditions

Sample temperature, °F	644
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 273-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6		13.02	0.01	
16 hr	411.8	15.2	13.81	0.06	
24 hr	426.7	19.3	14.01	0.02	
40 hr	464.7	29.9	14.58	0.03	
48 hr	486.1	35.9	14.92	0.02	4

Metal Specimen Data

Weight change, mg/cm²:	Al	-0.02
	Ti	0.00
	Ag	-0.10
	Steel	0.06
	Cu	+0.16
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown-yellow
	Ag	Yellow
	Steel	Pale blue
	Cu	Black spots
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	Very L var

Test Conditions

Sample temperature, °F	644
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 273-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON F-1041 AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5		12.88	0.00	
16 hr	1,050	196	21.04	0.26	
24 hr	2,109	495	29.30	0.25	
40 hr	15,096	4158	70.54	0.40	
48 hr	(a)		140.3	0.76	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	-0.02
	Ag	-0.65
	Steel	+1.06
	Cu	-0.89
	Mg	–
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Blue-green
	Ag	White
	Steel	Black deposits
	Cu	L etching
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	H var

Test Conditions

Sample temperature, °F	644
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Sample semisolidified at 100°F.

TEST NO. 273-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-20 AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	24.22		4.07	0.00	
16 hr	29.49	21.8	4.58	0.03	
24 hr	30.83	27.3	4.71	0.05	
40 hr	34.55	42.7	5.02	0.08	
48 hr	35.86	48.1	5.14	0.08	2

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.10
	Ti	0.00
	Ag	-2.21
	Steel	+0.10
	Cu	-9.57
	Mg	
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown-purple
	Ag	L etching
	Steel	Green-purple
	Cu	M etching
	Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var & L carbon

Test Conditions

Sample temperature, °F	644
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 273-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6		13.02	0.01	
16 hr	406.0	13.5	13.71	0.02	
24 hr	426.4	19.2	14.01	0.04	
40 hr	464.1	29.8	14.56	0.05	
48 hr	482.7	35.0	14.85	0.08	3

Metal Specimen Data

Weight change, mg/cm^2:	Al	0.00
	Ti	0.00
	Ag	-0.10
	Steel	+0.04
	Cu	+0.12
	Mg	–
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown-yellow
	Ag	Yellow
	Steel	Pale blue
	Cu	Black deposits
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	None

Test Conditions

Sample temperature, °F	644
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 273-7. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON F-1041 AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5		12.88	0.00	
16 hr	519.3	46.5	15.27	0.01	
24 hr	(a)				85

Metal Specimen Data

Weight change, mg/cm^2:	Al	+0.10
	Ti	+0.04
	Ag	0.04
	Steel	+0.02
	S. S	0.04
	Cu	+0.10
Metal discoloration, deposits pitting, or etching:	Al	L gray
	Ti	Brown-yellow
	Ag	L brown
	Steel	Black
	S. S.	L tan
	Cu	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	
	Centrifuge, vol %	
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	644
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Test cell dry at 24 hour sampling period

TEST NO. 273-8. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6		13.02	0.01	
16 hr	445.8	24.7	14.33	0.04	
24 hr	(a)				75

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	0.00
	Ag	−0.08
	Steel	−0.04
	S. S.	−0.06
	Cu	−0.14
Metal discoloration, deposits pitting, or etching:	Al	L yellow
	Ti	Brown-yellow
	Ag	Yellow
	Steel	Pale blue
	S. S.	L pink
	Cu	Black-orange-purple

Test Cell Data

Sludge in oil:	200-mesh filter	
	Centrifuge, vol %	
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	644
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Test cell dry at 24-hour sampling period.

TEST NO. 275-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-10 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.32		4.61	0.26	
16 hr	16.71	−3.3	4.38	1.00	
24 hr	16.56	−4.4	4.34	1.14	
40 hr	15.31	−11.6	3.87	5.52	
48 hr	16.36	−5.5	3.98	13.20	8

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	−0.02
	Ag	−0.02
	Steel	+0.02
	Cu	−0.34
	Mg	−1.40
Metal discoloration, deposits, pitting, or etching:	Al	Yellow
	Ti	Brown
	Ag	Yellow-pink
	Steel	Blue
	Cu	L etching
	Mg	H etching

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	M var

Breakpoint Data

Neut. no.	26 hr
100°F vis	45 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 275-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-13 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.47	–	3.22	0.10	
16 hr	14.06	4.4	3.32	0.26	
24 hr	14.38	6.8	3.36	0.37	
40 hr	14.65	8.8	3.41	0.60	
48 hr	14.77	9.7	3.45	0.75	2

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	−0.30
	Mg	+0.10
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Tan
	Ag	No change
	Steel	Blue
	Cu	Gray-orange
	Mg	L gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut no	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 275-3. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-66-9 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	13.90		3.34	0.06				
16 hr	15.80	13.7	3.64	0.42	30.7			
24 hr	16.89	21.5	3.82	0.64	43.5			
40 hr	20.62	48.3	4.32	0.88	65.0			
48 hr	24.66	77.4	4.87	0.96	72.4	44	1.73	10.42

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−0.06
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Tan
	Ag	L yellow
	Steel	Blue
	Cu	Orange-pink
	Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 275-4. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-67-10 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	17.32		4.61	0.26				
16 hr	19.27	11.3	4.98	0.73	40.2			
24 hr	21.23	22.6	5.44	0.81	58.2			
40 hr	31.94	84.4	7.73	1.30	89.4			
48 hr	68.97	298	15.49	2.39	97.7	61	1.68	10.82

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	−0.02
	Steel	0.00
	Cu	0.00
	Mg	+0.36
Metal discoloration, deposits, pitting, or etching:	Al	Yellow
	Ti	Brown
	Ag	Yellow-pink
	Steel	Blue
	Cu	L brown-green
	Mg	Gray deposits

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	(a)
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

(a) Insufficient sample.

TEST NO. 275-5. RESULTS OF NONREFLUX OXIDATION-CORROSION TEST ON O-67-13 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Overhead Wt, g	Oil Loss, wt %	Overhead Sample	
							Acidity, mg KOH/g	Vis, cs/100°F
Initial	13.47		3.22	0.10				
16 hr	14.93	10.8	3.45	0.20	30.9			
24 hr	15.44	14.5	3.67	0.25	45.5			
40 hr	18.08	34.2	3.93	0.30	67.6			
48 hr	20.16	49.7	4.24	0.42	75.4	46	1.22	11.18

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	0.14
	Mg	+0.46
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Tan
	Ag	No change
	Steel	Blue
	Cu	L brown-pink
	Mg	Gray deposits

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	130
Condensate return	No

TEST NO. 277-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-720 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.26		3.39	0.38	
7 days	13.70	3.3	3.48	1.21	
14 days	14.98	13.0	3.63	7.58	
21 days	83.41	529	12.71	52.4	
26 days	(a)		700.7	51.6	21

Metal Specimen Data

Weight change, mg/cm²:

Al	−0.02
Ti	0.00
Ag	−0.08
Steel	+0.02
Cu	−1.07
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	Yellow
Ti	Blue-green
Ag	Yellow
Steel	Yellow-green
Cu	Etching & pitting
Mg	L yellow

Test Cell Data

Sludge in oil: 200-mesh filter
Centrifuge, vol %

Tube deposits: Below oil level — L var
At and above oil level — H var

Breakpoint Data

Neut. no. — 6 days
100°F vis — 13 days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Sample semisolidified.

TEST NO. 277-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-758 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.73		3.48	0.23	
7 days	14.34	4.4	3.51	0.98	
14 days	14.51	5.7	3.55	1.31	
21 days	14.62	6.5	3.55	1.60	
26 days	14.71	7.1	3.56	1.73	6

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	−3.06
Steel	0.00
Cu	−0.24
Mg	+0.03

Metal discoloration, deposits, pitting, or etching:

Al	Pink
Ti	Purple
Ag	Pink-blue
Steel	Blue-green
Cu	L pitting
Mg	Brown-green stain

Test Cell Data

Sludge in oil: 200-mesh filter — None
Centrifuge, vol % — Trace

Tube deposits: Below oil level — None
At and above oil level — M var

Breakpoint Data

Neut. no. — 26+ days
100°F vis — 26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 277-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON [illegible]

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.02		3.50	3.57	
7 days	14.61	4.2	3.57	2.96	
14 days	14.91	6.3	3.63	3.21	
21 days	15.27	8.9	3.68	2.89	
26 days	15.50	10.6	3.74	3.12	9

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	−0.02
	Steel	0.00
	Cu	−0.39
	Mg	−0.16
Metal discoloration, deposits, pitting, or etching:	Al	Pink
	Ti	Maroon
	Ag	Pink-blue
	Steel	L green
	Cu	L etching
	Mg	L pink

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	0.2
Tube deposits:	Below oil level	Very L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 277-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-9 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.90		3.34	0.06	
7 days	15.12	8.8	3.54	0.64	
14 days	15.49	11.4	3.58	0.77	
21 days	15.74	13.2	3.63	0.81	
26 days	15.72	13.1	3.63	0.85	8

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	−0.14
	Steel	0.00
	Cu	−0.04
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	L yellow
	Steel	Blue
	Cu	Bright orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 277-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.87		3.69	0.04	
7 days	15.26	2.6	3.76	0.88	
14 days	15.23	2.4	3.74	1.25	
21 days	15.38	3.4	3.76	1.47	
26 days	15.62	5.0	3.78	1.55	14

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	−0.06
Steel	+0.02
Cu	−0.16
Mg	+0.10

Metal discoloration, deposits, pitting, or etching:

Al	Pale blue
Ti	Blue
Ag	Pink-blue
Steel	L green
Cu	Brown
Mg	L gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 277-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-11 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.26		3.21	0.05	
7 days	14.37	8.4	3.33	0.67	
14 days	14.73	11.1	3.45	0.82	
21 days	14.97	12.9	3.46	0.83	
26 days	15.01	13.2	3.46	0.85	3

Metal Specimen Data

Weight change, mg/cm²:

Al	−0.02
Ti	0.00
Ag	−0.10
Steel	+0.02
Cu	−0.08
Mg	+0.59

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L tan
Ag	Yellow
Steel	Blue
Cu	Bright yellow
Mg	Gray deposit

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 280-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON T-1041 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5		12.88	0.00	
72 hr	6702	1790	53.59	1.13	8

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	0.00
	Ag	−0.28
	Steel	+0.17
	Cu	+0.99
	Mg	+0.14
Metal discoloration, deposits pitting, or etching:	Al	L brown-yellow
	Ti	Blue
	Ag	L etching
	Steel	Charcoal
	Cu	Black coating
	Mg	L brown-yellow

Test Cell Data

Sludge in oil:	200-mesh filter	
	Centrifuge, vol %	
Tube deposits:	Below oil level	None
	At and above oil level	H var & carbon

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 280-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6		13.02	0.01	
72 hr	426.7	19.3	14.09	0.03	
120 hr	466.2	30.4	14.47	0.13	
168 hr	514.7	43.9	15.34	0.13	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	−0.06
	Steel	+0.02
	Cu	+0.19
	Mg	+0.02
Metal discoloration, deposits pitting, or etching:	Al	L yellow
	Ti	L yellow-brown
	Ag	L yellow
	Steel	Pale blue-gray
	Cu	Black coating
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 280-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-20 AT 608°F

	Vis. cs/100°F	100°F Vis Increase, %	Vis. cs/210°F	Neut. No. mg KOH/g	Oil Loss wt %
Initial	24.22		4.07	0.00	
72 hr	31.36	29.5	4.73	0.07	
120 hr	35.65	47.2	5.05	0.10	
168 hr	40.79	68.4	5.50	0.13	3

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.12
Ti	0.00
Ag	−4.26
Steel	+0.04
Cu	−23.5
Mg	+0.75

Metal discoloration, deposits pitting, or etching:

Al	L yellow
Ti	Blue-tan
Ag	M etching & brown coating
Steel	Purple-brown
Cu	M etching & pitting
Mg	Dark gray coating

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	0.4
Tube deposits:	Below oil level	M var
	At and above oil level	M var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 280-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON F-1041 AT 608°F

	Vis. cs/100°F	100°F Vis Increase, %	Vis. cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5		12.88	0.00	
[illegible] hr	4700	1226	44.48	0.33	7

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.04
Ti	+0.06
Ag	+0.28
Steel	+0.18
Cu	+1.95
Mg	

Metal discoloration, deposits pitting, or etching:

Al	L brown-yellow
Ti	Blue
Ag	Very L brown coating
Steel	Charcoal deposits
Cu	Black coating
Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	
	Centrifuge, vol %	
Tube deposits:	Below oil level	None
	At and above oil level	H var & carbon

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 280-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6		13.02	0.01	
72 hr	426.1	19.2	14.04	0.10	
120 hr	464.6	29.9	14.48	0.16	
168 hr	513.8	43.7	15.27	0.18	3

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	0.00
	Ag	−0.08
	Steel	+0.02
	Cu	−0.41
	Mg	–
Metal discoloration, deposits pitting, or etching:	Al	L yellow
	Ti	L yellow-brown
	Ag	L yellow
	Steel	Pale blue-gray
	Cu	L etching
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 280-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-20 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	24.22	–	4.07	0.00	
72 hr	30.93	27.7	4.67	0.10	
120 hr	37.64	55.4	5.19	0.15	
168 hr	48.39	99.8	5.91	0.16	1

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.12
	Ti	0.00
	Ag	−6.33
	Steel	+0.08
	Cu	−1.87
	Mg	–
Metal discoloration, deposits pitting, or etching:	Al	L brown-yellow
	Ti	Yellow-blue
	Ag	M etching & brown coating
	Steel	Purple-brown
	Cu	M etching & pitting
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	M var
	At and above oil level	M var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 283-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-14 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.66	-	4.65	0.26	
7 days	17.60	−0.3	4.56	1.48	
14 days	16.97	−3.9	4.48	2.26	
21 days	29.46	+66.8	6.08	38.6	
26 days	-	-	-	50.5	24

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.06
	Ti	+0.06
	Ag	+0.04
	Steel	+0.04
	Cu	−2.56
	Mg	−0.77
Metal discoloration, deposits, pitting, or etching:	Al	Yellow-L brown
	Ti	Yellow-brown
	Ag	Yellow-L brown
	Steel	Purple-brown
	Cu	H etching
	Mg	Large pits

Test Cell Data

Sludge in oil:	200-mesh filter	-
	Centrifuge, vol %	-
Tube deposits:	Below oil level	H carbon & var
	At and above oil level	H carbon & var

Breakpoint Data

Neut. no.	17 days
100°F vis	14 days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 283-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-19 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.72	-	4.67	0.25	
7 days	17.51	−1.2	4.56	1.60	
14 days	15.80	−10.8	4.06	4.99	
21 days	-	-	-	46.8	
26 days	-	-	-	48.3	24

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.08
	Ti	+0.06
	Ag	+0.10
	Steel	+0.02
	Cu	−4.99
	Mg	−0.97
Metal discoloration, deposits, pitting, or etching:	Al	Yellow-L brown
	Ti	Yellow-brown
	Ag	Yellow-L brown
	Steel	Purple-brown
	Cu	H etching
	Mg	Large pits

Test Cell Data

Sludge in oil:	200-mesh filter	
	Centrifuge, vol %	-
Tube deposits:	Below oil level	H carbon & var
	At and above oil level	H carbon & var

Breakpoint Data

Neut. no.	5 days
100°F vis	14 days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 283-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.87	–	3.69	0.04	
7 days	15.28	2.8	3.71	1.05	
14 days	15.42	3.7	3.69	1.28	
21 days	15.54	4.5	3.76	1.44	
26 days	15.60	4.9	3.76	1.39	12

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.02
Ag	0.00
Steel	0.00
Cu	−0.22
Mg	+0.04

Metal discoloration, deposits, pitting, or etching:

Al	Pale blue
Ti	Blue
Ag	Brown-blue
Steel	Pale green
Cu	Brown
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	H var
	At and above oil level	M var

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 283-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-769 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.04	–	3.75	0.04	
7 days	15.16	0.8	3.76	1.04	
14 days	15.16	0.8	3.73	1.27	
21 days	15.28	1.6	3.74	1.41	
26 days	15.36	2.1	3.76	1.54	9

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.06
Ag	−0.06
Steel	+0.02
Cu	−0.14
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	Pale blue
Ti	Blue
Ag	Brown-blue
Steel	Pale green
Cu	Brown
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	Very L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 283-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-770 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.93		3.75	0.04	
7 days	15.22	1.3	3.78	1.00	
14 days	15.49	3.1	3.74	1.26	
21 days	15.65	4.1	3.79	1.34	
26 days	15.67	4.3	3.81	1.35	12

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	+0.04
	Ag	−0.02
	Steel	0.00
	Cu	−0.10
	Mg	+0.04
Metal discoloration, deposits, pitting, or etching:	Al	Pale blue
	Ti	Blue
	Ag	Brown-blue
	Steel	Pale green
	Cu	Brown
	Mg	L gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	Very L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 283-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-771 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.01		3.74	0.04	
7 days	15.18	1.1	3.77	1.08	
14 days	15.03	0.1	3.71	1.28	
21 days	15.21	1.3	3.69	1.42	
26 days	15.26	1.7	3.75	1.45	8

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.06
	Ag	−0.04
	Steel	0.00
	Cu	−0.10
	Mg	−0.02
Metal discoloration, deposits, pitting, or etching:	Al	Pale blue
	Ti	Blue
	Ag	Brown-blue
	Steel	Pale green
	Cu	Brown
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	Very H var
	At and above oil level	M var

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 284-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-2 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	27.50	–	5.08	0.07	
16 hr	31.81	15.7	5.55	0.95	
24 hr	32.78	19.2	5.67	1.19	
40 hr	34.94	27.1	5.96	2.32	
48 hr	37.83	37.6	5.99	4.54	5

Metal Specimen Data

Weight change, mg/cm²:

Al	-0.62
Ti	0.00
Ag	-0.04
Steel	0.00
Cu	-0.10
Mg	–

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Very L brown
Ag	L yellow
Steel	Green-blue
Cu	Orange-yellow
Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	H var

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 284-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-36 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	28.33	–	5.31	0.14	
16 hr	31.80	12.2	5.74	0.95	
24 hr	32.52	14.8	5.84	1.11	
40 hr	33.97	19.9	6.02	1.58	
48 hr	35.08	23.8	6.15	2.80	4

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.02
Ag	0.00
Steel	0.00
Cu	-0.32
Mg	–

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Very L brown
Ag	L yellow
Steel	Dark green-blue
Cu	L etching
Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	H var

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 284-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-4 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	29.19		5.41	0.10	
16 hr	32.45	11.2	5.67	0.93	
24 hr	33.50	14.8	5.87	1.31	
40 hr	38.94	33.4	6.44	4.47	
48 hr	42.49	45.6	6.83	7.46	7

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	-0.04
	Steel	0.00
	Cu	-0.47
	Mg	
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Very L brown
	Ag	No change
	Steel	Pale blue
	Cu	Very L etching
	Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	M var

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 290-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-61-17 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No. mg KOH/g	Oil Loss, wt %
Initial	15.69		3.57	0.04	
16 hr	17.66	12.6	3.85	0.84	
24 hr	17.96	14.5	3.91	1.12	
40 hr	18.95	20.8	4.05	2.11	
48 hr	19.92	27.0	4.21	5.19	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	-0.04
	Steel	0.00
	Cu	-0.36
	Mg	
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L yellow-brown
	Ag	L yellow
	Steel	Blue-purple
	Cu	L etching
	Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	Very L var
	At and above oil level	M var

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 290-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-62-25 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.59	–	3.51	0.06	
16 hr	17.03	9.2	3.74	1.14	
24 hr	18.34	17.6	3.82	2.58	
40 hr	22.39	43.6	4.49	9.03	
48 hr	24.89	59.7	4.85	11.61	7

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	-0.06
	Steel	0.00
	Cu	-1.38
	Mg	–
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L yellow-brown
	Ag	L yellow
	Steel	Brown-blue
	Cu	M etching
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 290-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-33 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	18.12	–	4.09	0.14	
16 hr	18.97	4.7	4.08	2.21	
24 hr	19.97	10.2	4.21	2.54	
40 hr	22.31	23.1	4.53	3.48	
48 hr	24.60	35.8	4.84	7.52	7

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	+0.02
	Ag	+0.04
	Steel	0.00
	Cu	-19.2
	Mg	–
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L yellow-brown
	Ag	White
	Steel	Pale green-blue
	Cu	M etching
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 290-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-401 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	26.30	–	5.13	0.11	
16 hr	33.45	27.2	6.04	1.95	
24 hr	37.22	41.5	6.48	2.36	
40 hr	46.62	77.3	7.57	3.03	
48 hr	53.18	102	8.29	5.02	7

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	0.00
Steel	0.00
Cu	-5.17
Mg	–

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	No change
Steel	Blue
Cu	L etching
Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 290-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-402 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	46.84	–	8.25	0.12	
16 hr	53.12	13.4	8.74	1.56	
24 hr	57.50	22.8	9.20	2.24	
40 hr	69.34	48.0	10.45	2.81	
48 hr	76.30	62.9	11.17	4.26	6

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	0.00
Steel	+0.02
Cu	-8.03
Mg	

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	No change
Steel	Blue
Cu	M etching
Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 291-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-4 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	29.19		5.41	0.10	
16 hr	31.00	6.2	5.61	0.40	
24 hr	31.51	7.9	5.67	0.44	
40 hr	32.27	10.6	5.76	0.51	
48 hr	32.56	11.5	5.69	0.53	5

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−0.30
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Tan
	Ag	No change
	Steel	Purple
	Cu	L brown
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 291-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-6 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.38		3.32	0.03	
16 hr	14.01	4.7	3.41	0.20	
24 hr	14.27	6.7	3.44	0.36	
40 hr	14.66	9.6	3.52	0.77	
48 hr	14.72	10.0	3.55	1.11	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	0.00
	Steel	0.00
	Cu	0.00
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown
	Ag	L yellow
	Steel	Blue-green
	Cu	Orange-pink
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 291-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-8 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.24	-	3.26	0.23	
16 hr	14.25	7.6	3.44	1.02	
24 hr	14.41	8.8	3.47	1.19	
40 hr	14.71	11.0	3.52	1.39	
48 hr	14.81	11.9	3.53	1.50	5

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−0.12
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Tan
	Ag	L yellow
	Steel	Purple
	Cu	L brown
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 291-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-13 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.47	-	3.22	0.10	
16 hr	13.98	3.8	3.33	0.22	
24 hr	14.27	5.9	3.37	0.34	
40 hr	14.68	9.0	3.42	0.50	
48 hr	14.77	9.7	3.45	0.59	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	−0.22
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Tan
	Ag	L yellow
	Steel	Blue
	Cu	L blue
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 291-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-769 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.04	–	3.75	0.04	
16 hr	14.98	−0.4	3.69	0.68	
24 hr	14.98	−0.4	3.71	0.85	
40 hr	14.99	−0.3	3.68	1.08	
48 hr	14.93	−0.7	3.67	1.20	3

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	+0.02
	Ag	0.00
	Steel	0.00
	Cu	−0.10
	Mg	+0.04
Metal discoloration, deposits, pitting, or etching:	Al	Yellow
	Ti	Brown
	Ag	Yellow
	Steel	Blue
	Cu	Peacock
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 291-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-770 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.03	–	3.75	0.04	
16 hr	14.88	−1.0	3.70	0.75	
24 hr	14.99	−0.3	3.71	0.91	
40 hr	14.85	−1.2	3.68	1.10	
48 hr	14.84	−1.3	3.66	1.26	1

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	0.00
	Steel	0.00
	Cu	−0.10
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	Yellow
	Ti	Brown
	Ag	Yellow
	Steel	Blue
	Cu	Peacock
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 291-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-771 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.01		3.74	0.04	
16 hr	15.08	+0.5	3.73	0.70	
24 hr	15.02	+0.1	3.72	0.79	
40 hr	14.97	-0.3	3.64	1.03	
48 hr	14.94	-0.5	3.67	1.23	2

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	-0.02
	Steel	0.00
	Cu	-0.10
	Mg	+0.04
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown
	Ag	Yellow
	Steel	Blue
	Cu	Pink-brown
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 293-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-60-18 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.13		3.17	0.19	
7 days	12.72	4.9	3.28	1.21	
14 days	12.74	5.0	3.29	1.82	
21 days	12.82	5.7	3.30	2.23	
26 days	12.78	5.4	3.29	2.29	13

Metal Specimen Data

Weight change, mg/cm²:	Al	+3.85
	Ti	+2.35
	Ag	+1.74
	Steel	+2.31
	Cu	+0.24
	Mg	+2.23
Metal discoloration, deposits, pitting, or etching:	Al	Brown-black deposit
	Ti	Brown-black deposit
	Ag	Brown-black deposit
	Steel	Brown-black deposit
	Cu	Black-orange deposit
	Mg	Brown-black deposit

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	H var
	At and above oil level	M var

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 293-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-12 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.79	-	3.52	0.25	
7 days	14.68	6.4	3.68	1.46	
14 days	14.58	5.7	3.67	2.13	
21 days	14.62	6.0	3.68	2.55	
26 days	14.60	5.9	3.65	2.78	9

Metal Specimen Data

Weight change, mg/cm²:

Al	+3.06
Ti	+1.79
Ag	+1.16
Steel	+1.68
Cu	+0.30
Mg	+1.85

Metal discoloration, deposits, pitting, or etching:

Al	Brown-black deposit
Ti	Brown-black deposit
Ag	Brown-black deposit
Steel	Brown-black deposit
Cu	Brown-black deposit, L pitting
Mg	Brown-black deposit

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	H var
	At and above oil level	M var

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 293-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-18 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss wt %
Initial	16.84	-	4.29	0.11	
7 days	17.31	2.8	4.35	1.76	
14 days	17.08	1.4	4.26	3.23	
21 days	16.94	0.6	4.19	5.05	
26 days	17.08	1.4	4.22	5.45	13

Metal Specimen Data

Weight change, mg/cm²:

Al	−0.08
Ti	0.00
Ag	−0.14
Steel	+0.06
Cu	0.00
Mg	−0.08

Metal discoloration, deposits, pitting, or etching:

Al	Yellow
Ti	Yellow
Ag	Yellow
Steel	Brown-yellow
Cu	Black-orange
Mg	Yellow-tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	H var

Breakpoint Data

Neut. no.	14 days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 293-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-11 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.41	–	4.30	0.16	
7 days	15.93	-2.9	4.18	0.28	
14 days	45.77	+179	7.58	37.3	
21 days	161.2	+982	17.33	53.6	
26 days	solid	–	–	–	27

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	+0.02
Ag	−0.10
Steel	+0.02
Cu	−1.54
Mg	−11.5

Metal discoloration, deposits, pitting, or etching:

Al	Yellow-tan
Ti	Yellow-brown
Ag	L yellow
Steel	Green-purple-blue
Cu	L etching & pitting
Mg	H pitting

Test Cell Data

Sludge in oil:	200-mesh filter	–
	Centrifuge, vol %	–
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	10 days
100°F vis	10 days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 293-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-769 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.04	–	3.75	0.04	
7 days	15.28	1.6	3.77	0.79	
14 days	15.35	2.1	3.76	1.20	
21 days	15.60	3.7	3.82	1.68	
26 days	15.66	4.1	3.80	1.54	13

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	−0.04
Ag	−0.06
Steel	0.00
Cu	−0.20
Mg	−0.08

Metal discoloration, deposits, pitting, or etching:

Al	Pale blue
Ti	Blue
Ag	Purple
Steel	Blue-green
Cu	Very L etching
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 293-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON K-1054[a] AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.29	–	4.18	0.16	
7 days	16.24	−0.3	4.11	1.26	
14 days	15.98	−1.9	4.02	1.93	
21 days	15.74	−3.4	3.92	3.35	
26 days	16.23	−0.4	3.91	9.39	9

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	+0.04
Steel	−0.04
Cu	−0.34
Mg	−0.02

Metal discoloration, deposits, pitting, or etching:

Al	Pale blue
Ti	Pale green
Ag	Yellow
Steel	L green
Cu	L etching
Mg	L yellow-green

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	19 days
100°F vis	26 days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Blend (1:1) of O-65-19 and O-65-21.

TEST NO. 294-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-2 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	27.50	–	5.08	0.07	
7 days	31.22	13.5	5.51	0.30	
14 days	32.10	16.7	5.62	0.33	
21 days	32.74	19.1	5.69	0.42	
26 days	32.93	19.7	5.71	0.42	10

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	−0.02
Ag	−0.08
Steel	0.00
Cu	−0.04
Mg	−0.02

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	L yellow
Steel	Green-blue
Cu	Yellow-orange-purple
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 294-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-7 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.34	–	4.58	0.26	
7 days	16.95	-2.2	4.46	1.13	
14 days	16.27	-6.2	4.27	1.95	
21 days	19.45	+12.2	4.49	25.0	
26 days	(a)	–	–	–	19

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	-0.02
	Steel	0.00
	Cu	-2.58
	Mg	-0.59
Metal discoloration, deposits, pitting, or etching:	Al	Yellow
	Ti	Yellow
	Ag	Yellow
	Steel	Brown-purple
	Cu	H etching
	Mg	Yellow-brown

Test Cell Data

Sludge in oil:	200-mesh filter	–
	Centrifuge, vol %	–
Tube deposits:	Below oil level	L var
	At and above oil level	H var

Breakpoint Data

Neut. no.	14 days
100°F vis	16 days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Sample soldified at 26 days.

TEST NO. 294-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-8 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.24	–	3.26	0.23	
7 days	14.77	11.6	3.53	1.22	
14 days	15.16	14.5	3.61	1.46	
21 days	15.49	17.0	3.67	1.82	
26 days	15.56	17.5	3.68	1.84	11

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	-0.02
	Ag	-0.10
	Steel	0.00
	Cu	-0.57
	Mg	-0.08
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L yellow
	Steel	Blue
	Cu	L etching
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	–
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 294-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-11 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.26		3.21	0.05	
7 days	14.42	8.7	3.41	0.62	
14 days	14.81	11.7	3.48	0.71	
21 days	15.13	14.1	3.51	0.83	
26 days	15.17	14.4	3.53	0.90	7

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	−0.10
Steel	0.00
Cu	−0.08
Mg	−0.04

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	L yellow
Steel	Blue-green
Cu	Brown-yellow
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 294-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-13 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.47		3.22	0.10	
7 days	14.84	10.2	3.46	0.30	
14 days	15.36	14.0	3.57	0.19	
21 days	16.44	22.0	3.71	0.47	
26 days	17.00	26.2	3.80	0.55	14

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	−0.08
Steel	0.00
Cu	−6.01
Mg	−0.04

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	No change
Steel	Blue
Cu	M etching
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 294-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-20 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.48	–	3.25	0.21	
7 days	14.80	9.8	3.49	0.47	
14 days	15.27	13.3	3.56	0.49	
21 days	15.64	16.0	3.62	0.49	
26 days	15.86	17.7	3.65	0.56	10

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	−0.10
	Steel	0.00
	Cu	−0.47
	Mg	−0.04
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L brown-purple
	Ag	L brown
	Steel	Blue-green-purple
	Cu	L etching
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	–
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 295-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-19 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.49		3.21	0.12	
16 hr	12.90	3.3	3.28	0.68	
24 hr	13.08	4.7	3.32	1.13	
40 hr	13.32	6.6	3.35	2.06	
48 hr	13.43	7.5	3.38	2.30	2

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	+0.02
	Mg	+0.08
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	Yellow
	Steel	Blue-green-purple
	Cu	Orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 295-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-20 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.48	–	3.25	0.21	
16 hr	14.26	5.8	3.38	0.39	
24 hr	14.48	7.4	3.41	0.53	
40 hr	14.67	8.8	3.44	0.73	
48 hr	14.76	9.5	3.46	0.85	1

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	−0.02
	Ag	0.00
	Steel	+0.06
	Cu	−0.06
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L tan
	Steel	Blue-green
	Cu	Brown-orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 295-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-21 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.92	–	3.15	0.14	
16 hr	13.59	5.2	3.25	0.35	
24 hr	13.82	7.0	3.29	0.54	
40 hr	14.05	8.7	3.33	0.84	
48 hr	14.10	9.1	3.35	0.92	1

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	0.00
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	No change
	Steel	Blue-purple
	Cu	Yellow-orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 295-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON L-1129[a] AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.96	-	3.74	0.05	
16 hr	14.95	−0.1	3.71	0.70	
24 hr	15.00	+0.3	3.72	0.80	
40 hr	14.85	−0.7	3.68	1.12	
48 hr	14.80	−1.1	3.66	1.28	2

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	−0.02
	Ag	−0.02
	Steel	0.00
	Cu	−0.14
	Mg	+0.04
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown
	Ag	Yellow-brown
	Steel	Blue
	Cu	Brown-purple
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	M var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Blend (1:1) of ATL-769 and ATL-771.

TEST NO. 295-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON L-1136[a] AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.05	-	4.13	0.17	
16 hr	15.92	−0.8	4.05	0.79	
24 hr	15.78	−1.7	4.03	0.89	
40 hr	15.47	−3.6	3.94	1.40	
48 hr	15.15	−5.6	3.84	2.04	2

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	−0.02
	Ag	0.00
	Steel	+0.02
	Cu	−0.08
	Mg	−0.08
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown
	Ag	Yellow
	Steel	Blue
	Cu	Brown-purple
	Mg	L gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	M var

Breakpoint Data

Neut. no.	47 hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Blend (1:1) of O-67-7 and O-67-9.

TEST NO. 296-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-60-18 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.12	–	3.19	0.20	
24 hr	13.03	7.5	3.37	1.74	
40 hr	13.01	7.3	3.33	2.54	
48 hr	13.10	8.1	3.34	3.11	
64 hr	15.74	29.9	3.74	15.73	
72 hr	18.14	49.7	4.10	21.6	6

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.83
	Ti	+0.37
	Ag	+0.32
	Steel	+0.34
	Cu	−0.39
	Mg	+0.32
Metal discoloration, deposits, pitting, or etching:	Al	Dark brown deposit
	Ti	Dark brown deposit
	Ag	Dark brown deposit
	Steel	Dark brown deposit
	Cu	L pitting
	Mg	Dark brown deposit M pitting

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	H var
	At and above oil level	M var

Breakpoint Data

Neut. no.	53 hr
100°F vis	54 hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 296-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-12 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.79	–	3.52	0.25	
24 hr	14.54	5.4	3.77	1.95	
40 hr	14.69	6.5	3.68	2.52	
48 hr	14.95	8.4	3.73	2.83	
64 hr	14.95	8.4	3.72	4.07	
72 hr	15.30	10.9	3.76	7.56	3

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.61
	Ti	+0.37
	Ag	+0.26
	Steel	+0.30
	Cu	−0.14
	Mg	+0.36
Metal discoloration, deposits, pitting, or etching:	Al	Dark brown deposit
	Ti	Dark brown deposit
	Ag	Dark brown deposit
	Steel	Dark brown deposit
	Cu	Black-orange
	Mg	Dark brown deposit

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	0.2
Tube deposits:	Below oil level	M var
	At and above oil level	M carbon

Breakpoint Data

Neut. no.	60 hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 296-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-18 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.84	–	4.29	0.11	
24 hr	16.96	+0.7	4.24	2.04	
40 hr	16.54	−1.8	4.07	6.63	
48 hr	17.65	+4.8	4.22	11.66	
64 hr	21.54	+27.9	4.80	19.95	
72 hr	24.56	+45.8	5.36	23.4	5

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	+0.02
	Steel	+0.08
	Cu	−1.22
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	Yellow
	Ti	Yellow-green
	Ag	Yellow-green
	Steel	Brown-blue-purple
	Cu	L etching
	Mg	Yellow-brown

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	18 hr
100°F vis	43 hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 296-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-24 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.71	–	4.67	0.24	
24 hr	16.87	−4.7	4.38	1.80	
40 hr	16.89	−4.6	4.06	12.02	
48 hr	18.47	+4.3	4.32	16.73	
64 hr	50.68	+186	8.27	22.9	
72 hr	273.6	+1445	43.78	24.4	8

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.04
	Cu	−1.74
	Mg	−33.1
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Pale blue-brown
	Ag	L yellow
	Steel	Brown-blue
	Cu	L etching
	Mg	H etching & pitting

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	M var
	At and above oil level	M var

Breakpoint Data

Neut. no.	30 hr
100°F vis	41 hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 296-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-19 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.72	–	4.67	0.25	
24 hr	16.74	−5.5	4.33	1.85	
40 hr	15.71	−11.3	3.99	6.89	
48 hr	16.22	−8.5	3.98	11.44	
64 hr	18.54	+4.6	4.45	18.65	
72 hr	23.33	+31.7	5.47	19.89	7

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	−13.3
	Mg	−1.12
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Pale blue
	Ag	L yellow
	Steel	Brown-blue-green
	Cu	M etching
	Mg	M etching

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	28 hr
100°F vis	56 hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 297-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-21 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.11	–	3.76	0.07	
24 hr	15.25	+0.9	3.75	1.49	
40 hr	15.12	+0.1	3.69	1.93	
48 hr	14.98	−0.9	3.63	2.41	
64 hr	17.57	+16.3	3.97	11.11	
72 hr	19.72	+30.5	4.29	16.22	5

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	−0.22
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Blue-purple
	Ag	Yellow
	Steel	Pale green
	Cu	L etching
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	M var
	At and above oil level	L var

Breakpoint Data

Neut. no.	49 hr
100°F vis	54 hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 297-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-11 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.41	–	4.30	0.16	
24 hr	14.67	-10.6	3.78	1.22	
40 hr	17.18	+4.7	4.01	10.45	
48 hr	19.13	+16.6	4.31	14.10	
64 hr	23.95	+45.9	4.99	20.0	
72 hr	26.58	+62.0	5.37	23.8	8

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	-0.22
	Mg	-1.99
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Blue-purple
	Ag	Yellow
	Steel	Pale green
	Cu	L etching
	Mg	H etching

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	24 hr
100°F vis	30 hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 297-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-20 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.48	–	3.25	0.21	
24 hr	14.53	7.8	3.42	0.69	
40 hr	14.72	9.2	3.45	0.85	
48 hr	14.80	9.8	3.47	0.94	
64 hr	15.07	11.8	3.51	1.20	
72 hr	15.21	12.8	3.53	1.37	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.02
	Cu	-0.02
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Brown
	Ag	L yellow
	Steel	Blue
	Cu	Brown
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Breakpoint Data

Neut. no.	72+ hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 297-4. RESULTS OF REFLUX OXID. TION-CORROSION TEST ON K-1054[a] AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.29	--	4.18	0.16	
24 hr	15.93	-2.2	4.05	1.59	
40 hr	15.37	-5.6	3.84	3.03	
48 hr	15.69	-3.7	3.85	8.39	
64 hr	18.89	+16.0	4.31	17.65	
72 hr	21.04	+29.2	4.65	21.8	6

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	-1.08
	Mg	-0.30
Metal discoloration, deposits, pitting, or etching:	Al	Pale blue
	Ti	Blue
	Ag	Yellow
	Steel	L green
	Cu	M etching
	Mg	M etching

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	36 hr
100°F vis	52 hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Blend (1:1) of O-65-19 and O-65-21.

TEST NO. 298-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-7727 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.67	--	3.30	0.16	
16 hr	14.34	4.9	3.40	0.38	
24 hr	14.48	5.9	3.43	0.46	
40 hr	14.69	7.5	3.47	0.62	
48 hr	14.82	8.4	3.49	0.83	1

Metal Specimen Data

Weight change, mg/cm²:	Al	-0.02
	Ti	-0.02
	Ag	-0.04
	Steel	-0.02
	Cu	-0.12
	Mg	-0.06
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	L tan
	Steel	Blue-purple
	Cu	Brown-orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 300-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-20 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	24.22	–	4.07	0.0	
16 hr	27.07	11.6	4.37	0.10	
24 hr	27.45	13.3	4.44	0.03	
40 hr	28.48	17.6	4.51	0.04	
48 hr	28.18	16.4	4.51	0.04	2

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.24
Ti	+0.12
Ag	-0.08
Steel	+0.34
Cu	-6.08
Mg	+0.79

Metal discoloration, deposits, pitting, or etching:

Al	L yellow-gray
Ti	Gray-brown
Ag	L brown-white
Steel	Gray deposit
Cu	H etching and pitting
Mg	Brown deposit

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	0.3
Tube deposits:	Below oil level	L var
	At and above oil level	H var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 300-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-20 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut No., mg KOH/g	Oil Loss, wt %
Initial	24.22	–	4.07	0.00	
16 hr	27.14	12.1	4.37	0.08	
24 hr	27.62	14.0	4.41	0.02	
40 hr	28.52	17.8	4.46	0.06	
48 hr	28.31	16.9	4.52	0.04	2

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.22
Ti	+0.14
Ag	-0.08
Steel	+0.36
Cu	-6.37
Mg	

Metal discoloration, deposits, pitting, or etching:

Al	Brown deposit
Ti	Gray-brown
Ag	Brown-white
Steel	M etching
Cu	M etching & H pitting
Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	0.4
Tube deposits:	Below oil level	L var
	At and above oil level	H var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 300-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-20 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	24.22	–	4.07	0.00	
16 hr	27.17	12.2	4.37	0.10	
24 hr	33.45	38.1	4.84	0.04	
40 hr	34.62	42.9	4.95	0.08	
48 hr	34.49	42.4	4.95	0.07	6

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.34
	Ti	+0.16
	Ag	+0.34
	Steel	+0.45
	Cu	–
	Mg	–
Metal discoloration, deposits, pitting, or etching:	Al	Brown deposit
	Ti	Gray-brown
	Ag	M etching & brown deposit
	Steel	M etching
	Cu	–
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	0.4
Tube deposits:	Below oil level	H var
	At and above oil level	H var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 300-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON F-1041 AT 609°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5	–	12.88	0.00	
16 hr	477.0	34.5	14.40	0.08	
24 hr	571.4	61.2	16.10	0.13	
40 hr	973.1	174	20.68	0.29	
48 hr	1308	269	23.87	0.22	3

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	-0.02
	Ag	-0.34
	Steel	+0.10
	Cu	-1.00
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	Yellow
	Ti	Brown
	Ag	M etching
	Steel	Brown
	Cu	M etching
	Mg	Yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	M var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 300-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON F-1041 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5	–	12.88	0.00	
16 hr	495.6	39.8	15.09	0.13	
24 hr	686.9	93.8	17.52	0.25	
40 hr	1423	301	24.86	0.40	
48 hr	2131	501	30.23	0.49	7

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.16
	Ti	+0.02
	Ag	−0.37
	Steel	+0.08
	Cu	−0.81
	Mg	–
Metal discoloration, deposits, pitting, or etching:	Al	Yellow
	Ti	Brown
	Ag	L etching
	Steel	Black
	Cu	L etching
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	M var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 300-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON F-1041 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5	–	12.88	0.00	
16 hr	461.4	30.1	14.51	0.16	
24 hr	648.8	83.0	17.08	0.31	
40 hr	1950	450	29.04	0.54	
48 hr	4295	1111	40.08	0.63	3

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.08
	Ti	+0.02
	Ag	+0.34
	Steel	+0.10
	Cu	–
	Mg	–
Metal discoloration, deposits, pitting, or etching:	Al	Yellow
	Ti	Blue-purple-yellow
	Ag	Brown deposit
	Steel	Black
	Cu	–
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	M var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 300-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6	–	13.02	0.01	
16 hr	391.1	9.4	13.52	0.03	
24 hr	396.3	10.8	13.65	0.02	
40 hr	409.5	14.5	13.81	0.03	
48 hr	411.6	15.1	13.90	0.03	2

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.08
	Ti	+0.10
	Ag	−0.12
	Steel	−0.02
	Cu	−0.06
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown-yellow
	Ag	Yellow
	Steel	Blue-purple
	Cu	Orange-brown
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	M var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 300-8. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6	–	13.02	0.01	
16 hr	389.7	9.0	13.53	0.03	
24 hr	396.1	10.8	13.70	0.00	
40 hr	408.2	14.1	13.84	0.02	
48 hr	411.4	15.0	13.91	0.02	3

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	−0.04
	Ag	−0.10
	Steel	+0.02
	Cu	−0.14
	Mg	–
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown-yellow
	Ag	Yellow
	Steel	Blue-purple
	Cu	Orange-brown
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 300-9. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6	–	13.02	0.01	
16 hr	389.7	9.0	13.55	0.03	
24 hr	396.8	11.0	13.64	0.00	
40 hr	407.9	14.1	13.88	0.02	
48 hr	411.2	15.0	13.92	0.03	2

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	−0.04
	Ag	−0.10
	Steel	0.00
	Cu	–
	Mg	–
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown-yellow
	Ag	Yellow
	Steel	Blue-purple
	Cu	–
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 302-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-20 AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	24.22	–	4.07	0.00	
16 hr	29.50	21.8	4.61	0.05	
24 hr	31.00	28.0	4.75	0.04	
40 hr	34.19	41.2	5.03	0.03	
48 hr	33.59	38.7	5.01	0.03	2

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.28
	Ti	+0.08
	Ag	−0.36
	Steel	+0.63
	Cu	−6.19
	Mg	+1.01
Metal discoloration, deposits, pitting, or etching:	Al	Yellow deposit
	Ti	Brown
	Ag	L etching
	Steel	Gray deposit
	Cu	H pitting & L etching
	Mg	Gray deposit

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	0.4
Tube deposits:	Below oil level	M var
	At and above oil level	L carbon

Test Conditions

Sample temperature, °F	644
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 302-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-20 AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	24.22	–	4.07	0.00	
16 hr	28.95	19.5	4.57	0.03	
24 hr	30.59	26.3	4.71	0.06	
40 hr	33.38	37.8	4.97	0.05	
48 hr	33.54	38.5	5.00	0.03	1

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.36
Ti	+0.12
Ag	−0.49
Steel	+0.61
Cu	−5.70
Mg	–

Metal discoloration, deposits, pitting, or etching:

Al	Yellow deposit
Ti	Brown
Ag	L etching
Steel	Gray deposit
Cu	H pitting & L etching
Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	0.4
Tube deposits:	Below oil level	H var
	At and above oil level	L carbon

Test Conditions

Sample temperature, °F	644
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 302-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-20 AT

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Loss, wt %
Initial	24.22	–	4.07	0.00	
16 hr	29.04	19.9	4.55	0.05	
24 hr	30.65	26.5	4.69	0.05	
40 hr	33.71	39.2	4.96	0.07	
48 hr	33.90	40.0	4.99	0.07	1

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.34
Ti	+0.22
Ag	−0.26
Steel	+0.85
Cu	–
Mg	–

Metal discoloration, deposits, pitting, or etching:

Al	Brown deposit
Ti	Brown deposit
Ag	L etching
Steel	Brown deposit
Cu	–
Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	0.4
Tube deposits:	Below oil level	H var
	At and above oil level	L carbon

Test Conditions

Sample temperature, °F	644
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 302-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6	–	13.02	0.01	
16 hr	413.4	15.6	13.87	0.02	
24 hr	431.2	20.6	14.13	0.03	
40 hr	471.3	31.8	14.68	0.03	
48 hr	492.8	37.8	14.97	0.00	2

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.08
	Ti	−0.06
	Ag	−0.08
	Steel	+0.06
	Cu	+0.10
	Mg	−0.02
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown-yellow
	Ag	Yellow
	Steel	Pale blue
	Cu	H var
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	644
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 302-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6	–	13.02	0.01	
16 hr	411.8	15.2	13.87	0.01	
24 hr	430.5	20.4	14.08	0.02	
40 hr	471.5	31.9	14.68	0.03	
48 hr	491.2	37.4	14.99	0.00	2

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.06
	Ti	+0.04
	Ag	−0.12
	Steel	+0.10
	Cu	+0.12
	Mg	–
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown-yellow
	Ag	Yellow
	Steel	Pale blue
	Cu	H var
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	644
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 302-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis. cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6	–	13.02	0.01	
16 hr	414.9	16.0	13.94	0.04	
24 hr	434.8	21.6	14.18	0.03	
40 hr	481.6	34.7	14.84	0.03	
48 hr	510.2	42.7	15.26	0.06	2

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.04
	Ti	−0.04
	Ag	−0.08
	Steel	+0.06
	Cu	–
	Mg	–
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Brown-yellow
	Ag	Yellow
	Steel	Pale blue
	Cu	–
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	644
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 303-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ALO-716-P625893 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.50		3.61	3.29	
16 hr	14.87	2.6	3.69	3.96	
24 hr	14.97	3.2	3.69	3.70	
40 hr	15.07	3.9	3.73	4.15	
48 hr	15.82	9.1	3.82	8.39	3

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.08
	Ti	+0.04
	Ag	+0.04
	Steel	+0.02
	Cu	−0.43
	Mg	−0.45
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Yellow-tan
	Ag	L yellow
	Steel	L blue-yellow
	Cu	L etching
	Mg	L etching

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	0.6
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	37 hr
100°F vis	46 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 303-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ALO-7-7-P628985 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.91	–	3.47	1.57	
16 hr	14.37	3.3	3.53	2.29	
24 hr	14.47	4.0	3.55	2.35	
40 hr	14.62	5.1	3.58	2.57	
48 hr	14.79	6.3	3.61	3.75	1

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	+0.04
	Ag	+0.04
	Steel	−0.02
	Cu	−0.45
	Mg	−0.18
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Yellow-tan
	Ag	L yellow
	Steel	Blue
	Cu	L tan
	Mg	L etching

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	46 hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 303-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ALO-718-F622807 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.33	–	3.48	0.68	
16 hr	13.47	1.1	3.50	1.40	
24 hr	13.61	2.1	3.52	1.67	
40 hr	16.12	20.9	3.89	14.35	
48 hr	18.07	35.6	4.21	21.1	5

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.04
	Ti	+0.04
	Ag	+0.04
	Steel	+0.04
	Cu	−1.18
	Mg	−0.12
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Tan
	Ag	L yellow
	Steel	Blue
	Cu	L etching
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	M var

Breakpoint Data

Neut. no.	28 hr
100°F vis	30 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 304-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-20 AT 680°F[a]

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	24.22	-	4.07	0.00	
16 hr	34.36	41.9	5.07	0.02	
24 hr	41.98	73.3	5.62	0.02	
40 hr	57.77	138	6.61	0.04	
48 hr	62.13	156	6.93	0.01	5

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.18
	Ti	+0.16
	Ag	−0.97
	Steel	+0.77
	Cu	−5.50
	Mg	+1.22
Metal discoloration, deposits, pitting, or etching:	Al	Green
	Ti	Gray
	Ag	M etching
	Steel	Gray deposit
	Cu	H pitting & L etching
	Mg	Black deposit

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	0.2
Tube deposits:	Below oil level	L var
	At and above oil level	L carbon

Test Conditions

Sample temperature, °F	680
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Sample temperature dropped to 670°F at 16 hr and held thereafter due to violent refluxing.

TEST NO. 304-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-20 AT 680°F[a]

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	24.22	-	4.07	0.00	
16 hr	33.17	37.0	4.99	0.03	
24 hr	35.97	48.5	5.37	0.03	
40 hr	43.39	79.2	5.76	0.02	
48 hr	45.24	86.8	5.90	0.01	5

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.24
	Ti	+0.10
	Ag	−0.75
	Steel	+0.69
	Cu	−5.34
	Mg	
Metal discoloration, deposits, pitting, or etching:	Al	Green deposit
	Ti	Gray
	Ag	M etching
	Steel	Gray deposit
	Cu	H pitting & L etching
	Mg	-

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	0.2
Tube deposits:	Below oil level	L var
	At and above oil level	L carbon

Test Conditions

Sample temperature, °F	680
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Sample temperature dropped to 670°F at 16 hr and held thereafter due to violent refluxing.

TEST NO. 304-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-20 AT 680°F[a]

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	24.22		4.07	0.00	
16 hr	33.47	38.2	4.90	0.06	
24 hr	36.36	50.1	5.19	0.05	
40 hr	50.38	108	6.16	0.06	
48 hr	54.13	124	6.43	0.03	4

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.28
Ti	+0.12
Ag	-0.77
Steel	+0.77
Cu	–
Mg	–

Metal discoloration, deposits, pitting, or etching:

Al	Gray-green deposit
Ti	Gray
Ag	M etching
Steel	Gray deposit
Cu	–
Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	M var
	At and above oil level	L carbon

Test Conditions

Sample temperature, °F	680
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Sample temperature dropped to 670°F at 16 hr and held thereafter due to violent refluxing.

TEST NO. 304-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 680°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6	–	13.02	0.01	
16 hr	493.3	38.0	14.92	0.01	
24 hr	589.8	64.9	16.12	0.03	
40 hr	1016	184	20.46	0.08	
48 hr	1438	302	23.67	0.10	3

Metal Specimen Data

Weight change, mg/cm²:

Al	-0.02
Ti	-0.02
Ag	-0.14
Steel	+0.06
Cu	-0.12
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Yellow
Ag	Yellow
Steel	Blue
Cu	No change
Mg	Red-black

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	0.2
Tube deposits:	Below oil level	None
	At and above oil level	M var

Test Conditions

Sample temperature, °F	680
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NC 304-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 680°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6	–	13.02	0.01	
16 hr	499.9	39.8	15.01	0.01	
24 hr	600.2	67.8	16.21	0.02	
40 hr	1023	186	20.35	0.02	
48 hr	1395	290	23.27	0.09	5

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.04
	Ti	−0.06
	Ag	−0.18
	Steel	+0.10
	Cu	−0.24
	Mg	–
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Yellow
	Ag	Yellow
	Steel	Blue
	Cu	L etching
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	0.3
Tube deposits:	Below oil level	None
	At and above oil level	M var

Test Conditions

Sample temperature, °F	680
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 304-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 680°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6	–	13.02	0.01	
16 hr	527.2	47.4	15.39	0.00	
24 hr	704.3	97.0	17.43	0.06	
40 hr	1850	417	26.80	0.16	
48 hr	3896	989	36.13	0.19	2

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	−0.02
	Ag	−0.16
	Steel	0.08
	Cu	–
	Mg	–
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Yellow
	Ag	Yellow
	Steel	Blue
	Cu	–
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	0.4
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Test Conditions

Sample temperature, °F	680
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 305-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-14 AT 365°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.71	–	4.67	0.24	
7 days	23.19	30.9	5.05	32.2	
8 days	93.69	429	15.36	34.0	
9 days	312.3	1663	36.48	33.3	13

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	+0.08
	Ag	+0.02
	Steel	+0.08
	Cu	−0.53
	Mg	−0.32
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Yellow-green
	Ag	Yellow
	Steel	Red-green
	Cu	L pitting & M etching
	Mg	M pitting

Test Cell Data

Sludge in oil:	200-mesh filter	–
	Centrifuge, vol %	–
Tube deposits:	Below oil level	L var
	At and above oil level	H var & L carbon

Breakpoint Data

Neut. no.	<7 days
100°F vis	1 day

Test Conditions

Sample temperature, °F	365
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 305-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-19 AT 365°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.72	–	4.67	0.25	
7 days	19.31	9.0	4.46	23.0	
8 days	24.82	40.1	5.61	27.0	
9 days	113.3	539	15.45	25.3	
10 days	113.2	539	19.94	22.7	
11 days	81.99	363	17.98	20.4	14

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	−0.02
	Steel	0.00
	Cu	−1.62
	Mg	−0.41
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Yellow-green
	Ag	Yellow
	Steel	Yellow
	Cu	M pitting
	Mg	L pitting & M etching

Test Cell Data

Sludge in oil:	200-mesh filter	–
	Centrifuge, vol %	–
Tube deposits:	Below oil level	L var
	At and above oil level	M & H var

Breakpoint Data

Neut. no.	<7 days
100°F vis	4 days

Test Conditions

Sample temperature, °F	365
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 305-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-7 AT 365°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.34	–	4.58	0.26	
7 days	19.52	12.6	4.48	23.5	
8 days	31.72	82.9	6.79	32.0	
9 days	330.8	1808	27.81	34.6	
10 days	238.4	1275	29.50	32.4	16

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.04
	Ti	+0.08
	Ag	−0.10
	Steel	0.00
	Cu	−0.97
	Mg	−0.04
Metal discoloration, deposits, pitting, or etching:	Al	L green
	Ti	Green
	Ag	Yellow
	Steel	L red
	Cu	L pitting & M etching
	Mg	L tan

Test Cell Data

Sludge in oil:	200-mesh filter	–
	Centrifuge, vol %	–
Tube deposits:	Below oil level	L var
	At and above oil level	M & H var

Breakpoint Data

Neut. no.	<7 days
100°F vis	4 days

Test Conditions

Sample temperature, °F	365
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 305-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 365°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.87	–	3.69	0.04	
7 days	14.88	0.1	3.63	2.40	
8 days	14.94	0.5	3.66	2.31	
9 days	15.08	1.4	3.69	2.18	
10 days	15.12	1.7	3.67	2.04	
11 days	15.08	1.4	3.69	1.80	
14 days	15.13	1.7	3.68	1.72	5

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.04
	Ti	+0.04
	Ag	−0.04
	Steel	−0.02
	Cu	−0.24
	Mg	−0.06
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Blue
	Ag	L orange
	Steel	Green
	Cu	M etching
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	M var

Breakpoint Data

Neut. no.	14+ days
100°F vis	14+ days

Test Conditions

Sample temperature, °F	365
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 305-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-11 AT 365°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.26	–	3.21	0.05	
7 days	14.84	11.9	3.47	0.99	
8 days	14.75	11.2	3.46	0.83	
9 days	14.69	10.8	3.45	0.86	
10 days	14.65	10.5	3.44	0.86	
11 days	14.57	9.9	3.45	0.87	
14 days	14.82	11.8	3.47	1.03	5

Metal Specimen Data

Weight change, mg/cm²:	Al	0.04
	Ti	0.00
	Ag	−0.06
	Steel	−0.02
	Cu	−0.02
	Mg	+0.12
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	L yellow
	Steel	Green
	Cu	Yellow
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	14+ days
100°F vis	14+ days

Test Conditions

Sample temperature, °F	365
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 305-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-20 AT 365°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.48	–	3.25	0.21	
7 days	15.13	12.2	3.52	0.92	
8 days	15.07	11.8	3.52	0.76	
9 days	15.04	11.6	3.51	0.74	
10 days	15.06	11.7	3.51	0.71	
11 days	14.98	11.1	3.50	0.71	
14 days	15.24	13.1	3.54	0.78	4

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	+0.02
	Ag	−0.06
	Steel	−0.04
	Cu	−3.33
	Mg	+0.14
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Tan
	Ag	L yellow
	Steel	Blue-green
	Cu	L etching & H pitting
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	14+ days
100°F vis	14+ days

Test Conditions

Sample temperature, °F	365
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 306-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON F-1041 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5	–	12.88	0.00	
16 hr	498.7	40.7	15.06	0.24	
24 hr	674.8	90.4	17.35	0.30	
40 hr	1413	299	24.70	0.48	
48 hr	2167	511	30.32	0.49	3

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	−0.04
Ag	−0.28
Steel	+0.16
Cu	−0.24
Mg	+0.06

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Yellow
Ag	L etching
Steel	Black
Cu	L pitting
Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	M var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 306-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON F-1041 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5	–	12.88	0.00	
16 hr	481.1	35.7	14.86	0.22	
24 hr	638.2	80.0	16.95	0.83	
40 hr	1261	256	23.80	0.48	
48 hr	1974	457	29.01	0.50	2

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	−0.06
Ag	−0.30
Steel	+0.20
Cu	+1.08
Mg	+0.06

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	Yellow
Ag	L etching
Steel	Black deposit
Cu	L pitting & gray deposit
Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	M var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 306-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6	–	13.02	0.01	
16 hr	389.0	8.8	13.53	0.03	
24 hr	395.5	10.6	13.64	0.00	
40 hr	408.7	14.3	13.82	0.00	
48 hr	415.4	16.2	13.92	0.03	3

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	−0.06
Steel	+0.06
Cu	+1.38
Mg	+0.04

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Yellow
Ag	L yellow
Steel	Purple
Cu	Gray deposit
Mg	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 306-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6	–	13.02	0.01	
16 hr	390.0	9.1	13.48	0.02	
24 hr	396.8	11.0	13.60	0.11	
40 hr	409.8	14.6	13.70	0.00	
48 hr	415.8	16.3	13.90	0.04	3

Metal Specimen Data

Weight change, mg/cm²

Al	0.00
Ti	0.00
Ag	−0.06
Steel	0.00
Cu	+1.81
Mg	+0.04

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Yellow
Ag	L yellow
Steel	Purple
Cu	Gray deposit
Mg	Tan

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 307-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-19 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.49	–	3.21	0.12	
16 hr	12.95	3.7	3.29	0.85	
24 hr	13.11	5.0	3.32	1.37	
40 hr	13.34	6.8	3.37	2.08	
48 hr	13.47	7.8	3.40	2.56	3

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	0.00
Ag	+0.04
Steel	−0.04
Cu	+1.44
Mg	+0.04

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	No change
Ag	L yellow
Steel	Yellow-green
Cu	Orange deposit
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 307-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-20 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.48	–	3.25	0.21	
16 hr	14.28	5.9	3.37	0.42	
24 hr	14.43	7.0	3.40	0.56	
40 hr	14.63	8.5	3.44	0.80	
48 hr	14.73	9.3	3.46	0.91	2

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.04
Ti	+0.06
Ag	+0.04
Steel	−0.04
Cu	+1.50
Mg	−0.08

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L tan
Ag	L brown
Steel	Blue
Cu	Tan deposit
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 307-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.04	–	3.47	0.24	
16 hr	13.18	1.1	3.44	1.46	
24 hr	13.22	1.4	3.43	1.54	
40 hr	13.22	1.4	3.44	2.19	
48 hr	13.28	1.8	3.45	2.50	3

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.06
	Ti	+0.04
	Ag	0.00
	Steel	+3.23
	Cu	+1.76
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	No change
	Ag	L brown
	Steel	L tan deposit
	Cu	Black deposit
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 307-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-1 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.29	–	3.21	0.00	
16 hr	13.81	3.9	3.30	0.21	
24 hr	14.06	5.8	3.34	0.39	
40 hr	14.25	7.2	3.37	0.66	
48 hr	14.38	8.2	3.39	0.79	3

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.08
	Ti	+0.06
	Ag	−0.02
	Steel	+2.82
	Cu	+2.29
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	L yellow
	Steel	Purple deposit
	Cu	Orange deposit
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 308-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-805 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.62	–	3.76	0.41	
16 hr	15.06	3.0	3.83	1.65	
24 hr	15.16	3.7	3.83	1.96	
40 hr	15.26	4.4	3.84	2.82	
48 hr	15.46	5.7	3.89	3.99	4

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.04
	Ti	−0.06
	Ag	0.00
	Steel	+0.04
	Cu	+1.44
	Mg	+0.08
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L yellow
	Ag	Yellow
	Steel	Green
	Cu	Brown deposit
	Mg	L brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	1.0
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Breakpoint Data

Neut. no.	45 hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 308-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-806 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.27	–	3.54	0.45	
16 hr	14.55	2.0	3.59	1.03	
24 hr	14.58	2.2	3.60	1.39	
40 hr	14.87	4.2	3.60	2.74	
48 hr	16.31	14.3	3.83	9.00	4

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.06
	Ti	0.00
	Ag	−0.08
	Steel	0.00
	Cu	−0.08
	Mg	+0.04
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L yellow
	Ag	Yellow
	Steel	Blue
	Cu	Brown
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	M var

Breakpoint Data

Neut. no.	36 hr
100°F vis	42 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 308-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-807 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.78	–	3.59	0.34	
16 hr	14.04	1.9	3.63	1.19	
24 hr	14.00	1.6	3.60	1.43	
40 hr	15.21	10.4	3.78	9.41	
48 hr	16.66	20.9	4.01	15.79	5

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.04
	Ti	0.00
	Ag	−0.08
	Steel	0.00
	Cu	−0.75
	Mg	−0.04
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L yellow
	Ag	Yellow
	Steel	Blue
	Cu	M pitting
	Mg	L brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	M var

Breakpoint Data

Neut. no.	28 hr
100°F vis	38 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 308-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-808 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.38	–	3.39	0.39	
16 hr	13.69	2.3	3.42	0.98	
24 hr	13.76	2.8	3.44	1.12	
40 hr	13.88	3.7	3.46	1.74	
48 hr	15.19	13.5	3.65	7.68	5

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	−0.06
	Steel	+0.02
	Cu	+1.89
	Mg	+0.06
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L yellow
	Ag	Yellow
	Steel	Blue
	Cu	Brown deposit
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	40 hr
100°F vis	43 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 308-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-809 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.37	–	3.35	0.36	
16 hr	13.69	2.4	3.41	0.99	
24 hr	13.76	2.9	3.43	1.13	
40 hr	13.91	4.0	3.45	1.67	
48 hr	15.19	13.6	3.64	7.05	3

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	0.00
	Ag	−0.08
	Steel	+0.06
	Cu	+2.47
	Mg	+0.06
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L yellow
	Ag	Yellow
	Steel	Blue
	Cu	Brown deposit
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	40 hr
100°F vis	43 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 308-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-810 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.89	–	3.65	0.32	
16 hr	14.08	1.4	3.67	0.98	
24 hr	14.13	1.7	3.66	1.16	
40 hr	15.10	8.7	3.79	9.21	
48 hr	16.39	18.0	3.98	15.87	5

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.04
	Ti	0.00
	Ag	−0.08
	Steel	+0.12
	Cu	−0.83
	Mg	−0.12
Metal discoloration, deposits, pitting, or etching:	Al	L brown
	Ti	L yellow
	Ag	Yellow
	Steel	Blue
	Cu	M pitting
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	M var

Breakpoint Data

Neut. no.	30 hr
100°F vis	40 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 308-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-7725 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.67	-	3.54	0.50	
16 hr	13.87	1.5	3.56	1.00	
24 hr	14.24	4.2	3.58	3.34	
40 hr	17.69	29.4	4.12	16.86	
48 hr	19.79	44.8	4.46	22.5	7

Metal Specimen Data

Weight change, mg/cm²:

Al	-0.04
Ti	0.00
Ag	-0.04
Steel	+0.04
Cu	-1.97
Mg	-0.10

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L yellow
Ag	Yellow
Steel	Blue
Cu	M pitting & L etching
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	M var

Breakpoint Data

Neut. no.	17 hr
100°F vis	28 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 309-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON F-1041 AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5	-	12.88	0.00	
16 hr	1,173	231	22.09	0.19	
24 hr	2,788	686	32.94	0.40	
40 hr	26,106	7,264	93.80	0.40	
48 hr	147,438	41,490	220.0	0.38	4

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.02
Ag	-0.47
Steel	+0.16
Cu	-0.34
Mg	+0.16

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	Blue
Ag	L etching
Steel	Black
Cu	L etching
Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	-
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Test Conditions

Sample temperature, °F	644
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 309-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON F-1041 AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5	–	12.88	0.00	
16 hr	1,085	206	21.26	0.25	
24 hr	2,346	562	38.38	0.24	
40 hr	15,175	4,181	73.04	0.32	
48 hr	58,334	16,355	142.0	0.35	4

Metal Specimen Data

Weight change, mg/cm²:		
	Al	0.00
	Ti	0.00
	Ag	−0.67
	Steel	+0.20
	Cu	−0.83
	Mg	−0.22

Metal discoloration, deposits, pitting, or etching:		
	Al	No change
	Ti	Blue
	Ag	L etching
	Steel	Black deposit
	Cu	L pitting & etching
	Mg	L etching

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	–
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Test Conditions

Sample temperature, °F	644
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 309-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6		13.02	0.01	
16 hr	412.3	15.3	13.84	0.04	
24 hr	430.0	20.2	14.09	0.02	
40 hr	463.5	29.6	14.53	0.04	
48 hr	482.4	34.9	14.87	0.00	4

Metal Specimen Data

Weight change, mg/cm²:		
	Al	0.00
	Ti	0.00
	Ag	−0.14
	Steel	+0.16
	Cu	+0.24
	Mg	+0.04

Metal discoloration, deposits, pitting, or etching:		
	Al	No change
	Ti	L brown
	Ag	Yellow
	Steel	Gray
	Cu	Black deposit
	Mg	Brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	644
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 309-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6	–	13.02	0.01	
16 hr	412.2	15.3	13.84	0.04	
24 hr	430.4	20.4	14.08	0.07	
40 hr	466.0	30.3	14.55	0.02	
48 hr	486.0	35.9	14.88	0.01	3

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	+0.02	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	-0.08	Tube deposits:	Below oil level	None
	Steel	+0.20		At and above oil level	L var
	Cu	+0.16			
	Mg	+0.06			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	L brown	Sample temperature, °F		644
	Ag	Yellow.	Sample volume, ml		200
	Steel	Gray deposit	Air rate, liter/hr		10
	Cu	Black	Condensate return		Yes
	Mg	Brown			

TEST NO. 309-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1041[a] AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss wt %
Initial	71.34	–	6.88	0.09	
16 hr	98.64	38.3	8.03	0.07	
24 hr	112.1	57.1	8.54	0.12	
40 hr	145.5	104	9.66	0.18	
48 hr	164.1	130	10.23	0.14	2

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	+0.04	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.02		Centrifuge, vol %	0.8
	Ag	-0.26	Tube deposits:	Below oil level	L var
	Steel	-0.45		At and above oil level	M var
	Cu	-4.42			
	Mg	-0.37			
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	L brown	Sample temperature, °F		644
	Ag	L etching	Sample volume, ml		200
	Steel	L etching	Air rate, liter/hr		10
	Cu	M pitting & L etching	Condensate return		Yes
	Mg	L etching			

(a) Blend (1:1) of O-64-20 and O-67-1.

TEST 310-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1041[a] AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	71.34		6.88	0.09	
16 hr	80.87	13.4	7.27	0.00	
24 hr	82.90	16.2	7.34	0.62	
40 hr	85.30	19.6	7.47	0.03	
48 hr	86.50	21.2	7.53	0.02	1

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	−0.02
	Ag	−0.34
	Steel	−0.16
	Cu	−4.85
	Mg	−0.02
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Yellow
	Ag	L pitting
	Steel	Black
	Cu	L pitting & H etching
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Blend (1:1) of O-64-20 and O-67-1.

TEST NO. 312-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-2 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	27.41	–	5.04	0.10	
24 hr	30.75	12.2	5.43	0.52	
40 hr	31.36	14.4	5.52	0.67	
48 hr	31.68	15.6	5.55	0.54	
64 hr	32.23	17.6	5.65	0.59	
72 hr	32.51	18.6	5.65	0.55	5

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	−0.02
	Steel	0.00
	Cu	−0.04
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L yellow
	Ag	L yellow
	Steel	Blue
	Cu	Blue-red
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	72+ hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 312-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-3 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.77	–	3.13	0.24	
24 hr	13.70	7.3	3.27	1.28	
40 hr	13.93	9.1	3.31	1.28	
48 hr	14.02	9.8	3.32	1.19	
64 hr	14.19	11.1	3.36	1.38	
72 hr	14.24	11.5	3.36	1.81	5

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.04
Ag	−0.02
Steel	0.00
Cu	+0.10
Mg	−0.08

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L yellow
Ag	L yellow
Steel	Blue
Cu	Orange
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no	72+ hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 312-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-7 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	17.34	–	4.58	0.26	
24 hr	16.50	−4.8	4.32	1.76	
40 hr	15.65	−9.8	3.90	10.19	
48 hr	17.17	−1.0	4.10	16.02	
64 hr	24.83	+43.1	5.57	26.2	
72 hr	162.1	+835	37.50	31.0	10

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.04
Ag	0.00
Steel	0.00
Cu	−3.65
Mg	−14.4

Metal discoloration, deposits, pitting, or etching:

Al	L yellow
Ti	L green
Ag	Yellow
Steel	Green
Cu	M etching
Mg	H pitting & etching

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	M var & L carbon

Breakpoint Data

Neut. no.	19 hr
100°F vis	41 hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 312-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.87	–	3.69	0.04	
24 hr	14.82	−0.3	3.66	1.37	
40 hr	14.65	−1.5	3.63	1.63	
48 hr	14.59	−1.9	3.58	2.74	
64 hr	17.47	+17.5	3.97	12.28	
72 hr	19.57	+31.6	4.29	16.98	6

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.04
	Ti	+0.04
	Ag	−0.06
	Steel	−0.04
	Cu	−0.47
	Mg	−0.04
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Purple
	Ag	Yellow
	Steel	Blue
	Cu	L pitting
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	M & H var

Breakpoint Data

Neut. no.	44 hr
100°F vis	53 hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 312-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-11 AT 329°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.26	–	3.21	0.05	
24 hr	14.24	7.4	3.36	0.95	
40 hr	14.48	9.2	3.42	1.23	
48 hr	14.61	10.2	3.41	1.31	
64 hr	14.88	12.2	3.48	1.48	
72 hr	15.01	13.2	3.50	1.84	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	-0.02
	Steel	0.00
	Cu	-0.02
	Mg	-0.04
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L yellow
	Ag	No change
	Steel	Green
	Cu	Yellow
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	72+ hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 312-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-21 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.92	–	3.15	0.14	
24 hr	13.96	8.0	3.32	0.80	
40 hr	14.13	9.4	3.33	1.28	
48 hr	14.24	10.2	3.36	1.55	
64 hr	14.41	11.5	3.38	1.25	
72 hr	14.49	12.2	3.41	1.57	3

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	−0.08
Ag	−0.04
Steel	0.00
Cu	−0.06
Mg	−0.02

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L yellow
Ag	No change
Steel	Blue-green
Cu	Yellow
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	72+ hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 312-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.04	–	3.47	0.24	
24 hr	13.22	1.4	3.44	2.27	
40 hr	13.29	1.9	3.44	2.87	
48 hr	13.70	5.1	3.47	6.34	
64 hr	17.74	36.0	4.06	23.9	
72 hr	20.82	59.7	4.51	33.3	7

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	−0.06
Ag	−0.10
Steel	0.00
Cu	−0.30
Mg	−3.83

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L yellow
Ag	L brown
Steel	Purple
Cu	L etching
Mg	M pitting

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	40 hr
100°F vis	53 hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 312-8. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-1 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.29	–	3.21	0.00	
24 hr	14.17	6.6	3.36	0.62	
40 hr	14.43	8.5	3.39	0.80	
48 hr	14.54	9.4	3.41	0.83	
64 hr	14.71	10.7	3.44	0 99	
72 hr	14.78	11.2	3.45	1.29	3

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	−0.02
	Ag	−0.04
	Steel	0.00
	Cu	−0.04
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L yellow
	Ag	L yellow
	Steel	Purple-yellow
	Cu	Red-green
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	None

Breakpoint Data

Neut. no.	72+ hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 313-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-20 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	24.27		4.08	0.10	
72 hr	30.93	27.4	4.71	0.11	
120 hr	35.95	48.1	5.11	0.09	
168 hr	40.37	66.3	5.43	0.09	1

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.14
	Ti	+0.06
	Ag	−5.38
	Steel	−0.06
	Cu	−27.4
	Mg	
Metal discoloration, deposits pitting, or etching:	Al	Brown
	Ti	L yellow-blue
	Ag	M etching
	Steel	Green-red
	Cu	H etching & pitting
	Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 314-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-2 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	27.41		5.04	0.10	
24 hr	31.11	13.5	5.48	0.63	
40 hr	32.01	16.8	5.58	0.63	
48 hr	32.35	18.0	5.62	0.71	
64 hr	33.11	20.8	5.72	0.74	
72 hr	33.52	22.3	5.76	1.01	4

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	+0.04
Steel	+0.06
Cu	0.00
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	L yellow
Steel	Blue-green
Cu	Orange
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	72+ hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	401
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 314-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-12 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.79		3.52	0.25	
24 hr	14.88	7.9	3.71	2.74	
40 hr	14.95	8.4	3.72	3.60	
48 hr	15.22	10.4	3.77	5.13	
64 hr	18.59	34.8	4.18	15.91	
72 hr	21.21	53.8	4.63	20.5	4

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.63
Ti	+0.41
Ag	+0.36
Steel	+0.37
Cu	−0.67
Mg	+0.41

Metal discoloration, deposits pitting, or etching

Al	Black-brown deposit
Ti	Black-brown deposit
Ag	Black-brown deposit
Steel	Black-brown deposit
Cu	L etching
Mg	Black-brown deposit

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	H var
	At and above oil level	H var & L carbon

Breakpoint Data

Neut. no.	41 hr
100°F vis	52 hr

Test Conditions

Sample temperature, °F	401
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 314-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-21 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.11	—	3.76	0.07	
24 hr	15.11	0.0	3.69	1.95	
40 hr	15.72	4.0	3.68	7.55	
48 hr	17.41	15.2	3.91	10.98	
64 hr	22.10	46.3	4.66	17.80	
72 hr	24.95	65.1	5.08	21.7	6

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.04
	Ti	+0.02
	Ag	0.00
	Steel	+0.04
	Cu	−0.36
	Mg	−0.16
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Blue
	Ag	L yellow
	Steel	Green
	Cu	L etching
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	M var

Breakpoint Data

Neut. no.	18 hr
100°F vis	40 hr

Test Conditions

Sample temperature, °F	401
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 314-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-3 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.77	—	3.13	0.24	
24 hr	13.82	8.2	3.30	1.35	
40 hr	14.11	10.5	3.34	1.72	
48 hr	14.25	11.6	3.36	1.73	
64 hr	16.53	29.4	3.68	6.02	
72 hr	19.12	49.7	4.02	10.58	4

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.04
	Ti	0.00
	Ag	0.00
	Steel	+0.08
	Cu	+0.06
	Mg	−0.04
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	No change
	Ag	L yellow
	Steel	Brown
	Cu	Orange-brown
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	56 hr
100°F vis	56 hr

Test Conditions

Sample temperature, °F	401
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 314-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.87	–	3.69	0.4	
24 hr	14.75	−0.8	3.63	1.68	
40 hr	15.44	+3.8	3.65	7.58	
48 hr	17.24	+15.9	3.93	12.57	
64 hr	22.57	+51.8	4.74	19.08	
72 hr	25.87	+74.0	5.26	22.6	6

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−0.59
	Mg	−0.08
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Blue
	Ag	L yellow
	Steel	Green
	Cu	L etching
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L & M var

Breakpoint Data

Neut. no.	33 hr
100°F vis	40 hr

Test Conditions

Sample temperature, °F	401
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 314-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-11 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.26	–	3.21	0.05	
24 hr	14.42	8.7	3.38	1.32	
40 hr	14.77	11.4	3.45	1.32	
48 hr	15.02	13.3	3.49	2.12	
64 hr	19.84	49.6	4.13	9.46	
72 hr	22.90	72.7	4.53	11.88	5

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.06
	Ti	0.00
	Ag	+0.02
	Steel	0.00
	Cu	0.00
	Mg	−0.06
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	No change
	Ag	L yellow
	Steel	Yellow
	Cu	Yellow
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	46 hr
100°F vis	54 hr

Test Conditions

Sample temperature, °F	401
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 314-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-20 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.48	–	3.25	0.21	
24 hr	14.69	9.0	3.39	1.01	
40 hr	15.00	11.3	3.49	1.59	
48 hr	15.22	12.9	3.49	1.64	
64 hr	16.58	23.0	3.70	4.47	
72 hr	18.61	38.1	4.00	9.03	5

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	+0.04
Steel	+0.04
Cu	−0.18
Mg	−0.02

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	L yellow
Steel	Blue
Cu	Brown
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	55 hr
100°F vis	61 hr

Test Conditions

Sample temperature, °F	401
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 314-8. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-1 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.29	–	3.21	0.00	
24 hr	14.41	8.4	3.37	0.84	
40 hr	14.66	10.3	3.43	1.26	
48 hr	14.83	11.6	3.45	1.44	
64 hr	15.23	14.6	3.51	1.77	
72 hr	15.84	19.2	3.60	3.61	4

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	0.00
Ag	+0.06
Steel	+0.12
Cu	−0.10
Mg	0.00

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	L yellow
Steel	Red-yellow
Cu	Red-green
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	65 hr
100°F vis	71 hr

Test Conditions

Sample temperature, °F	401
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 315-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1051[a] AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.81	--	3.38	0.08	
16 hr	14.29	3.5	3.47	0.42	
24 hr	14.41	4.3	3.47	0.52	
40 hr	14.51	5.1	3.49	0.69	
48 hr	14.55	5.4	3.50	0.85	1

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	+0.04
	Ag	0.00
	Steel	+0.04
	Cu	−0.04
	Mg	−0.06
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	No change
	Steel	Blue
	Cu	Yellow-orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Blend (1:1:1) of O-67-9, O-67-11, and O-67-20.

TEST NO. 315-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1052[a] AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No. mg KOH/g	Oil Loss, wt %
Initial	13.58	--	3.41	0.16	
16 hr	14.02	3.2	3.46	0.49	
24 hr	14.06	3.5	3.44	0.70	
40 hr	14.20	4.6	3.47	1.17	
48 hr	14.24	4.9	3.45	1.46	2

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−0.18
	Mg	−0.08
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	L brown
	Steel	Purple
	Cu	Brown
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Blend (1:1:1:1) of O-67-9, O-67-11, O-67-20, and O-67-24.

TEST NO. 315-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON M-1053[a] AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.71	–	3.34	0.12	
16 hr	14.28	4.2	3.44	0.32	
24 hr	14.36	4.7	3.44	0.43	
40 hr	14.50	5.8	3.39	0.62	
48 hr	14.57	6.3	3.47	0.82	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	−0.02
	Ag	0.00
	Steel	0.00
	Cu	−0.10
	Mg	−0.02
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L tan
	Ag	No change
	Steel	Blue
	Cu	Orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Blend (1:1:1:1) of O-67-9, O-67-11, O-67-20, and O-68-1.

TEST NO. 316-1. RESULT OF REFLUX OXIDATION-CORROSION TEST ON F-1041 AT 644°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5	–	12.88	0.00	
16 hr	1,023	189	21.10	0.16	
24 hr	2,179	515	28.95	0.26	
40 hr	12,468	3517	66.55	(a)	
48 hr	Semisolid	–	121.1	0.34	4

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	−0.04
	Ag	−0.67
	Steel	+0.02
	Cu	−1.52
	Mg	−0.06
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Blue
	Ag	L etching
	Steel	Black
	Cu	L etching
	Mg	Gray

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	M var

Test Conditions

Sample temperature, °F	644
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Sample lost in handling.

TEST NO. 317-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-62-25 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.56	–	3.52	0.06	
16 hr	17.03	9.4	3.74	1.18	
24 hr	18.40	18.3	3.88	2.81	
40 hr	22.57	45.1	4.51	7.20	
48 hr	25.36	63.0	4.89	11.60	6

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.12
Ti	+0.08
Ag	+0.08
Steel	+0.02
Cu	−1.05
Mg	–

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	L yellow
Steel	Yellow-green
Cu	L pitting
Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 317-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-61-17 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.69		3.57	0.04	
16 hr	17.62	12.3	3.84	0.83	
24 hr	18.00	14.7	3.89	0.99	
40 hr	18.84	20.1	4.01	2.13	
48 hr	19.87	26.6	4.17	4.93	1

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.06
Ti	0.00
Ag	+0.18
Steel	+0.18
Cu	−0.24
Mg	

Metal discoloration, deposits, pitting, or etching:

Al	L brown
Ti	L brown
Ag	L yellow
Steel	Blue
Cu	L pitting
Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 317-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-33 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss wt %
Initial	18.12		4.09	0.14	
16 hr	19.01	4.9	4.09	2.18	
24 hr	19.96	10.2	4.20	3.03	
40 hr	23.27	28.4	4.64	5.97	
48 hr	26.28	45.0	5.06	10.00	15

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.16
	Ti	+0.08
	Ag	+0.24
	Steel	+0.16
	Cu	-13.5
	Mg	
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L gray deposit
	Steel	Blue-green
	Cu	L pitting & H etching
	Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 317-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-1 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs 210°F	Neut. No. mg KOH g	Oil Loss, wt %
Initial	25.48		5.06	0.14	
16 hr	33.21	30.3	6.01	1.99	
24 hr	36.99	45.2	6.46	2.14	
40 hr	48.02	88.5	7.75	3.67	
48 hr	56.40	121	8.69	5.54	6

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.18
	Ti	0.04
	Ag	+0.14
	Steel	+0.16
	Cu	-6.25
	Mg	
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	No change
	Steel	Blue
	Cu	L etching & pitting
	Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L & M var

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 317-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-2 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	27.50	–	5.08	0.07	
16 hr	31.47	14.4	5.54	0.94	
24 hr	32.44	18.0	5.65	1.29	
40 hr	34.74	26.3	5.90	2.40	
48 hr	36.49	32.7	6.10	4.28	3

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.14
Ti	-0.06
Ag	+0.16
Steel	+0.12
Cu	-0.14
Mg	–

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	L yellow
Steel	Green
Cu	Orange
Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 317-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-7 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	74.74	–	6.03	0.25	
16 hr	91.97	23.1	6.79	0.90	
24 hr	101.1	35.3	7.09	0.99	
40 hr	137.8	84.4	8.77	2.25	
48 hr	231.4	210	10.87	3.86	4

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.06
Ti	+0.12
Ag	+0.16
Steel	+0.14
Cu	-5.54
Mg	

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	No change
Steel	Blue
Cu	L pitting & etching
Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 317-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-13 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	28.43	–	5.32	0.28	
16 hr	31.00	9.0	5.68	0.51	
24 hr	31.89	12.2	5.78	0.83	
40 hr	34.73	22.2	6.13	3.07	
48 hr	36.38	28.0	6.33	7.51	4

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.12
Ag	−0.10
Steel	+0.12
Cu	−2.17
Mg	–

Metal discoloration, deposits, pitting, or etching:

Al	L brown
Ti	L green
Ag	Brown
Steel	Blue-green
Cu	M etching
Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 317-8. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-16 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	26.69		5.13	0.20	
16 hr	30.53	14.4	5.57	1.48	
24 hr	31.46	17.9	5.69	1.87	
40 hr	33.72	26.3	5.95	3.23	
48 hr	35.30	32.30	6.14	5.80	2

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	+0.08
Ag	+0.16
Steel	+0.08
Cu	+0.10
Mg	

Metal discoloration, deposits, pitting, or etching

Al	No change
Ti	L brown
Ag	L brown
Steel	Yellow-green
Cu	Orange
Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 318-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-719 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.38		4.00	5.86	
16 hr	16.58	1.2	4.02	5.98	
24 hr	16.59	1.3	4.04	7.05	
40 hr	18.12	10.6	4.19	14.81	
48 hr	19.64	19.9	4.41	19.54	3

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.14
	Ti	+0.08
	Ag	+0.14
	Steel	+0.18
	Cu	−0.75
	Mg	+0.18
Metal discoloration, deposits, pitting, or etching:	Al	L brown
	Ti	Yellow-brown
	Ag	L yellow
	Steel	Purple
	Cu	L pitting
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	M var

Breakpoint Data

Neut. no.	20 hr
100°F vis	36 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 318-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-720 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.26		3.39	0.38	
16 hr	13.53	2.0	3.43	0.84	
24 hr	13.56	2.3	3.44	1.10	
40 hr	14.78	11.5	3.62	7.16	
48 hr	16.60	25.2	3.90	14.08	2

Metal Specimen Data

Weight change, mg/cm².	Al	+0.16
	Ti	+0.16
	Ag	+0.08
	Steel	0.00
	Cu	−0.51
	Mg	+0.16
Metal discoloration, deposits, pitting, or etching	Al	L brown
	Ti	Yellow-brown
	Ag	L yellow
	Steel	Blue
	Cu	L etching
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	29 hr
100°F vis	38 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 318-3. RESULTS OF REFLUX OXIDATION CORROSION TEST ON ATL-753 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No. mg KOH/g	Oil Loss, wt
Initial	14.02		3.50	3.57	
16 hr	14.38	2.6	3.52	2.95	
24 hr	14.52	3.6	3.54	3.13	
40 hr	14.64	4.4	3.57	3.48	
48 hr	14.70	4.9	3.57	3.44	1

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.18
Ti	+0.16
Ag	+0.10
Steel	+0.06
Cu	−0.18
Mg	+0.08

Metal discoloration, deposits, pitting, or etching:

Al	L brown
Ti	Yellow-brown
Ag	L yellow
Steel	Blue
Cu	Brown
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 318-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-753 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.73		3.48	0.23	
16 hr	14.14	3.0	3.48	0.71	
24 hr	14.17	3.2	3.48	0.95	
40 hr	14.24	3.7	3.46	1.33	
48 hr	14.25	3.8	3.50	1.39	1

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.16
Ti	+0.12
Ag	+0.16
Steel	+0.12
Cu	−0.20
Mg	+0.08

Metal discoloration, deposits, pitting, or etching:

Al	L brown
Ti	Yellow-brown
Ag	L yellow
Steel	Blue
Cu	L etching
Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 319-1. RESULTS OF REFLUX OXIDATION CORROSION TEST ON O-65-16 AT 428°F

	Vis. cs/100°F	100°F Vis Increase, %	Vis. cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	28.43		5.31	0.14	
16 hr	31.52	11.3	5.75	0.93	
24 hr	32.30	14.0	5.85	1.16	
40 hr	33.75	19.1	6.03	2.09	
48 hr	34.84	23.0	6.15	2.51	5

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.00		Centrifuge, vol %	None
	Ag	+0.06			
	Steel	0.02	Tube deposits:	Below oil level	None
	Cu	-0.20		At and above oil level	L & M var
	Mg				
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	L brown	Sample temperature, °F		428
	Ag	L brown	Sample volume, ml		200
	Steel	Green	Air rate, liter/hr		10
	Cu	L etching	Condensate return		Yes
	Mg				

TEST NO. 319-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-14 AT 428°F

	Vis. cs/100°F	100°F Vis Increase, %	Vis. cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	26.24		4.95	0.00	
16 hr	29.76	13.5	5.51	1.23	
24 hr	30.76	17.4	5.64	1.75	
40 hr	33.51	27.9	5.97	4.37	
48 hr	35.35	34.9	6.15	6.09	5

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	0.04		Centrifuge, vol %	None
	Ag	+0.05			
	Steel	0.04	Tube deposits:	Below oil level	None
	Cu	0.37		At and above oil level	L var
	Mg				
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Test Conditions		
	Ti	L brown	Sample temperature, °F		428
	Ag	L brown	Sample volume, ml		200
	Steel	L purple	Air rate, liter/hr		10
	Cu	L etching	Condensate return		Yes
	Mg				

TEST NO. 319-3. RESULTS OF REFLUX OXIDATION CORROSION TEST ON O-66-15 AT 428°F

	Vis. cs/100°F	100°F Vis Increase, %	Vis. cs/210°F	Neut. No., mg KOH/g	Oil Loss wt %
Initial	28.61		5.36	0.14	
16 hr	32.24	12.7	5.80	0.86	
24 hr	33.03	15.4	5.90	1.07	
40 hr	34.69	21.3	6.09	1.96	
48 hr	36.00	25.8	6.23	2.29	5

Metal Specimen Data

Weight change, mg/cm²:

Al	−0.04
Ti	+0.04
Ag	+0.06
Steel	−0.02
Cu	−0.41
Mg	...

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	No change
Steel	L green
Cu	L etching
Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L & M var

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 319-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-16 AT 428°F

	Vis. cs/100°F	100°F Vis Increase, %	Vis. cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	25.98		5.02	0.01	
16 hr	29.93	15.2	5.51	1.40	
24 hr	31.05	19.5	5.65	1.81	
40 hr	34.34	32.2	6.04	4.64	
48 hr	37.00	42.4	6.35	6.62	5

Metal Specimen Data

Weight change, mg/cm²:

Al	0.00
Ti	+0.10
Ag	+0.06
Steel	0.00
Cu	−0.61
Mg	

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	No change
Steel	Yellow-green
Cu	L etching
Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 319-5. RESULTS OF REFLUX OXIDATION CORROSION TEST ON O-67 4 AT 428°F

	Vis. cs/100°F	100°F Vis Increase, %	Vis. cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	29.19		5.41	0.10	
16 hr	32.16	10.2	5.73	1.12	
24 hr	33.12	13.5	5.83	3.04	
40 hr	36.34	24.5	6.20	4.43	
48 hr	39.06	33.8	6.47	8.11	3

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	0.00	Sludge in oil:	200-mesh filter	None
	Ti	+0.10		Centrifuge, vol %	None
	Ag	0.06			
	Steel	0.00	Tube deposits:	Below oil level	None
	Cu	0.39		At and above oil level	L var
	Mg				
Metal discoloration, deposits, pitting, or etching:	Al	No change	Test Conditions		
	Ti	L brown			
	Ag	No change	Sample temperature, °F		428
	Steel	Blue	Sample volume, ml		200
	Cu	L etching	Air rate, liter/hr		10
	Mg		Condensate return		Yes

TEST NO. 319-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-405 AT 428°F

	Vis. cs/100°F	100°F Vis Increase, %	Vis. cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	34.45		6.31	0.09	
16 hr	36.85	7.0	6.45	0.63	
24 hr	36.96	7.3	6.43	1.14	
40 hr	37.45	8.7	6.44	2.03	
48 hr	37.84	9.8	6.47	3.20	4

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	0.00	Sludge in oil:	200-mesh filter	Trace
	Ti	+0.10		Centrifuge, vol %	None
	Ag	0.00			
	Steel	0.00	Tube deposits:	Below oil level	L var
	Cu	0.22		At and above oil level	L var
	Mg				
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Test Conditions		
	Ti	Brown			
	Ag	L brown	Sample temperature, °F		428
	Steel	Yellow-green	Sample volume, ml		200
	Cu	L pitting	Air rate, liter/hr		10
	Mg		Condensate return		Yes

TEST NO. 319-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON MLO-62-1005 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	41.84		6.75	0.11	
16 hr	45.38	8.5	7.21	0.35	
24 hr	46.29	10.6	7.29	0.47	
40 hr	48.65	16.3	7.52	0.51	
48 hr	50.11	19.8	7.65	1.07	8

Metal Specimen Data

Weight change, mg/cm²:

Al	0.02
Ti	+0.06
Ag	+0.04
Steel	−0.12
Cu	−1.91
Mg	

Metal discoloration, deposits, pitting, or etching:

Al	L brown
Ti	L brown
Ag	L brown
Steel	Blue
Cu	L etching
Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	None'
	Centrifuge, vol %	1.5
Tube deposits:	Below oil level	L var
	At and above oil level	None

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 319-8. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON MLO-63-1002 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	46.75		8.18	0.16	
16 hr	52.82	13.0	8.70	1.72	
24 hr	57.52	23.0	9.19	2.77	
40 hr	69.57	48.8	10.48	3.36	
48 hr	77.86	66.5	11.36	4.50	7

Metal Specimen Data

Weight change, mg/cm²:

Al	−0.04
Ti	+0.04
Ag	0.02
Steel	0.04
Cu	8.68
Mg	

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	No change
Steel	Blue
Cu	M pitting
Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 320-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-1 AT 464°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	25.48		5.06	0.14	
16 hr	34.13	33.9	6.14	2.47	
24 hr	39.53	55.1	6.81	3.63	
40 hr	64.62	154	9.67	6.85	
48 hr	104.1	309	13.65	7.93	8

Metal Specimen Data

Weight change, mg/cm²	Al	0.00
	Ti	0.00
	Ag	0.06
	Steel	0.13
	Cu	7.26
	Mg	
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L yellow
	Ag	No change
	Steel	Green
	Cu	L etching & M pitting
	Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Test Conditions

Sample temperature, °F	464
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 320-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-17 AT 464°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	28.37		5.29	0.33	
16 hr	33.21	17.1	5.91	0.94	
24 hr	34.90	23.0	6.12	1.27	
40 hr	37.93	33.7	6.50	2.05	
48 hr	39.31	38.6	6.69	3.18	6

Metal Specimen Data

Weight change, mg/cm²	Al	+0.16
	Ti	+0.06
	Ag	0.02
	Steel	+0.04
	Cu	0.34
	Mg	
Metal discoloration, deposits, pitting, or etching:	Al	Brown
	Ti	Brown
	Ag	Yellow-orange
	Steel	Brown
	Cu	L etching
	Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	1.0
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Test Conditions

Sample temperature, °F	464
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 320-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON MLO-62-1005 AT 464°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	41.84		6.75	0.11	
16 hr	62.19	48.6	9.38	1.61	
24 hr	74.37	77.7	10.94	1.51	
40 hr	109.4	161	15.18	1.22	
48 hr	141.6	238	19.81	1.48	8

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	-0.02
Ag	0.00
Steel	-7.24
Cu	-0.85
Mg	

Metal discoloration, deposits pitting, or etching:

Al	Black-brown
Ti	L yellow
Ag	Yellow-black
Steel	L etching & M pitting
Cu	L etching
Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	6.8
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Test Conditions

Sample temperature, °F	464
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 320-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON MLO-63-1002 AT 464°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	42.75		8.18	0.16	
16 hr	56.40	20.6	9.09	2.46	
24 hr	64.94	38.9	10.01	2.88	
40 hr	96.46	106	13.38	4.93	
48 hr	138.0	195	17.41	6.24	8

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.04
Ti	-0.08
Ag	-0.06
Steel	0.00
Cu	-8.22
Mg	

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L yellow
Ag	No change
Steel	Green-brown
Cu	L etching & M pitting
Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions

Sample temperature, °F	464
Sample volume, ml	200
Air rate liter/hr	10
Condensate return	Yes

TEST NO. 321-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-17 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	28.37		5.29	0.33	
72 hr	36.70	29.4	6.36	1.02	
120 hr	42.19	48.7	6.98	2.10	
168 hr	66.97	136	10.15	5.05	11

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	+0.04
Ag	-0.14
Steel	-0.02
Cu	-20.9
Mg	

Metal discoloration, deposits, pitting, or etching:

Al	L brown
Ti	L green
Ag	L yellow
Steel	Brown
Cu	M etching & H pitting
Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	0.2
Tube deposits:	Below oil level	L var
	At and above oil level	L & M var

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 321-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON MLO-62-1005 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	41.84		6.75	0.11	
72 hr	55.66	33.0	8.25	0.48	
120 hr	86.42	107	12.41	0.35	
168 hr	88.68	112	12.53	0.45	18

Metal Specimen Data

Weight change, mg/cm²:

Al	-0.06
Ti	0.00
Ag	0.04
Steel	-0.41
Cu	-7.73
Mg	

Metal discoloration, deposits, pitting, or etching:

Al	L brown
Ti	L brown
Ag	Yellow-brown
Steel	L pitting
Cu	L pitting & M etching
Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	1.6
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 322-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-17 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	28.37		5.29	0.33	
16 hr	32.00	12.8	5.76	0.64	
24 hr	33.13	16.8	5.90	0.62	
40 hr	34.52	21.7	6.09	0.64	
48 hr	35.16	23.9	6.16	0.86	5

Metal Specimen Data

Weight change, mg/cm² :	Al	0.00
	Ti	+0.02
	Ag	0.00
	Steel	0.04
	Cu	0.55
	Mg	
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L brown
	Ag	L yellow
	Steel	Blue-purple
	Cu	L pitting & etching
	Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	0.4
Tube deposits:	Below oil level	L var
	At and above oil level	M var

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 322-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON MLO-63-1002 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	46.75		8.18	0.16	
16 hr	53.77	15.0	8.79	1.65	
24 hr	58.88	25.9	9.35	2.06	
40 hr	71.54	53.0	10.69	2.68	
48 hr	80.84	72.9	11.63	3.80	6

Metal Specimen Data

Weight change, mg/cm² :	Al	0.04
	Ti	0.00
	Ag	0.00
	Steel	0.06
	Cu	8.34
	Mg	
Metal discoloration, deposits pitting, or etching	Al	No change
	Ti	L brown
	Ag	No change
	Steel	Blue
	Cu	H pitting
	Mg	

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 323-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-814 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.45		3.37	0.23	
16 hr	14.21	5.7	3.49	0.28	
24 hr	14.49	7.7	3.54	0.79	
40 hr	16.61	23.5	3.84	7.19	
48 hr	18.61	38.4	4.02	11.36	4

Metal Specimen Data

Weight change, mg/cm²	Al	0.00
	Ti	+0.06
	Ag	−0.02
	Steel	0.00
	Cu	−0.63
	Mg	−0.08
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L yellow
	Ag	White
	Steel	Blue
	Cu	L etching
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	0.2
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	25 hr
100°F vis	32 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 323-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-825 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.08		3.56	4.26	
16 hr	14.35	1.9	3.61	4.89	
24 hr	14.47	2.8	3.63	5.39	
40 hr	16.24	15.3	3.86	15.41	
48 hr	17.69	25.6	4.18	20.4	5

Metal Specimen Data

Weight change, mg/cm²	Al	+0.02
	Ti	0.00
	Ag	−0.10
	Steel	−0.04
	Cu	−0.43
	Mg	−0.06
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	No change
	Ag	L yellow
	Steel	L brown
	Cu	L etching
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	Trace

Breakpoint Data

Neut. no.	25 hr
100°F vis	34 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 324-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-3 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.77		3.13	0.24	
7 days	14.02	9.8	3.35	0.68	
14 days	14.48	13.4	3.40	0.79	
21 days	14.77	15.7	3.45	0.67	
26 days	14.86	16.4	3.48	0.74	5

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.04
	Ag	−0.12
	Steel	0.00
	Cu	+0.12
	Mg	−0.04
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	No change
	Steel	Brown
	Cu	Gold
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 324-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.87		3.69	0.04	
7 days	15.19	2.2	3.75	0.88	
14 days	15.07	1.3	3.71	1.23	
21 days	15.09	1.5	3.71	1.50	
26 days	15.72	5.7	3.90	2.25	7

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	+0.04
	Ag	−0.08
	Steel	−0.02
	Cu	−0.10
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Blue
	Ag	L blue
	Steel	L greea
	Cu	Brown
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 324-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-21 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.92		3.15	0.14	
7 days	14.32	10.8	3.38	0.62	
14 days	14.63	13.2	3.43	0.75	
21 days	14.89	15.2	3.46	0.77	
26 days	15.04	16.4	3.47	0.95	6

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	+0.02
	Ag	0.00
	Steel	−0.02
	Cu	−0.02
	Mg	−0.04
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L yellow
	Steel	Blue
	Cu	Gold
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 324-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss wt %
Initial	13.04		3.47	0.24	
7 days	13.29	1.9	3.47	1.65	
14 days	13.31	2.1	3.44	2.64	
21 days	19.08	46.3	4.26	27.6	
26 days	36.08	177	6.48	60.3	15

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	+0.08
	Ag	−0.12
	Steel	0.00
	Cu	−0.63
	Mg	−5.38
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L yellow
	Steel	L brown
	Cu	L etching
	Mg	H pitting

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	M var

Breakpoint Data

Neut. no.	13 days
100°F vis	17 days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 324-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-2 AT 347°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.29		3.21	0.00	
7 days	14.56	9.6	3.41	0.45	
14 days	14.99	12.8	3.47	0.47	
21 days	15.36	15.6	3.55	0.58	
26 days	15.45	16.3	3.55	0.80	9

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.04
	Ti	−0.02
	Ag	0.00
	Steel	+0.02
	Cu	+0.02
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L yellow
	Steel	Green
	Cu	Orange
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	26+ days
100°F vis	26+ days

Test Conditions

Sample temperature, °F	347
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 325-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-60-18 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.13		3.17	0.19	
24 hr	12.72	4.9	3.29	1.41	
40 hr	12.74	5.0	3.32	1.94	
48 hr	13.00	7.2	3.33	2.02	
64 hr	13.05	7.6	3.33	3.08	
72 hr	13.32	9.8	3.37	6.29	4

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.20
	Ti	+0.26
	Ag	+0.20
	Steel	+0.22
	Cu	−0.36
	Mg	+0.22
Metal discoloration, deposits, pitting, or etching:	Al	Brown deposit
	Ti	Brown deposit
	Ag	Brown deposit
	Steel	Brown deposit
	Cu	L pitting
	Mg	Brown deposit

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	0.2
Tube deposits:	Below oil level	L & M var
	At and above oil level	M & H var

Breakpoint Data

Neut. no.	61 hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 325-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-12 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.80		3.52	0.53	
24 hr	14.64	6.1	3.66	1.59	
40 hr	14.51	5.1	3.67	1.94	
48 hr	14.82	7.4	3.70	2.13	
64 hr	14.87	7.8	3.71	2.62	
72 hr	14.69	6.4	3.67	3.07	5

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.26
	Ti	+0.14
	Ag	+0.15
	Steel	+0.20
	Cu	−0.04
	Mg	+0.12
Metal discoloration, deposits, pitting, or etching:	Al	Brown deposit
	Ti	Brown
	Ag	Brown
	Steel	Brown deposit
	Cu	Brown
	Mg	Brown

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	0.02
Tube deposits:	Below oil level	M & H var
	At and above oil level	H var & L carbon

Breakpoint Data

Neut. no.	72+ hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 325-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-21 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	15.11		3.76	0.07	
24 hr	15.27	1.1	3.71	1.24	
40 hr	15.16	0.3	3.70	1.44	
48 hr	15.22	0.7	3.71	1.42	
64 hr	15.69	3.8	3.67	5.64	
72 hr	17.23	14.0	3.91	10.14	6

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	−0.04
	Ag	+0.04
	Steel	+0.04
	Cu	−0.20
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Purple-yellow
	Ag	L yellow
	Steel	Green
	Cu	L etching
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L & M var

Breakpoint Data

Neut. no.	56 hr
100°F vis	65 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 325-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-66-11 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.41	–	4.30	0.16	
24 hr	15.90	−3.1	4.15	0.29	
40 hr	16.24	−1.0	3.88	8.68	
48 hr	18.82	+14.7	4.25	12 28	
64 hr	25.15	+53.3	5.10	19.08	
72 hr	28.74	+75.1	5.61	23.3	8

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.06
	Ti	−0.02
	Ag	+0.06
	Steel	−0.04
	Cu	−0.26
	Mg	−2.50
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L blue
	Ag	L yellow
	Steel	Green-yellow
	Cu	L etching
	Mg	L pitting & H etching

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	None

Breakpoint Data

Neut. no.	24 hr
100°F vis	40 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 325-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-3 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.77	–	3.13	0.24	
24 hr	13.64	6.8	3.26	0.77	
40 hr	13.83	8.3	3.30	0.98	
48 hr	13.86	8.5	3.30	1.00	
64 hr	14.08	10.3	3.32	1.20	
72 hr	14.10	10.4	3.33	1.35	3

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	0.00
	Ag	+0.02
	Steel	−0.06
	Cu	+0.10
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L yellow
	Ag	L yellow
	Steel	Blue-green
	Cu	Gold
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	72+ hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 325-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-9 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.87	–	3.69	0.04	
24 hr	14.96	+0.6	3.70	0.97	
40 hr	14.84	−0.7	3.67	1.23	
48 hr	14.77	−0.7	3.55	1.30	
64 hr	15.02	+1.0	3.51	4.95	
72 hr	16.82	+13.1	3.85	10.90	4

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.06
	Ti	−0.04
	Ag	+0.02
	Steel	−0.02
	Cu	−0.20
	Mg	−0.02
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	Purple
	Ag	L yellow
	Steel	Blue
	Cu	L etching
	Mg	L brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	None
	At and above oil level	L & M var

Breakpoint Data

Neut. no.	55 hr
100°F vis	66 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 325-7. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.04		3.47	0.24	
24 hr	13.19	1.2	3.45	1.69	
40 hr	13.24	1.5	3.45	2.03	
48 hr	13.23	1.5	3.52	2.26	
64 hr	13.88	6.4	3.52	6.50	
72 hr	15.42	18.3	3.71	16.08	5

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.02
	Ti	−0.08
	Ag	−0.02
	Steel	−0.02
	Cu	−0.12
	Mg	−0.24
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L yellow
	Ag	L brown
	Steel	L yellow
	Cu	L brown
	Mg	M etching

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	5[illegible] hr
100°F vis	64 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 326-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-64-2 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	27.50	–	5.08	0.07	
24 hr	30.71	11.7	5.43	0.38	
40 hr	31.42	14.3	5.51	0.52	
48 hr	31.68	15.2	5.54	0.68	
64 hr	32.28	17.4	5.62	0.73	
72 hr	32.60	18.5	5.66	0.63	4

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	−0.04
	Steel	+0.04
	Cu	−0.04
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L yellow
	Steel	Blue
	Cu	Gold-pink
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	72+ hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 326-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-31 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.40	–	3.23	0.08	
24 hr	14.41	7.5	3.38	0.99	
40 hr	14.74	10.0	3.45	1.22	
48 hr	14.85	10.8	3.46	1.29	
64 hr	15.16	13.1	3.51	1.46	
72 hr	15.23	13.7	3.53	1.57	2

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	−0.02
	Ag	−0.04
	Steel	+0.06
	Cu	+0.06
	Mg	−8.90
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L brown
	Steel	Red-green
	Cu	Gold
	Mg	H pitting & L etching

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	72+ hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 326-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-3 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.77	–	3.13	0.24	
24 hr	13.65	6.9	3.26	0.94	
40 hr	13.88	8.7	3.31	1.25	
48 hr	13.97	9.4	3.32	1.60	
64 hr	14.19	11.1	3.36	1.62	
72 hr	14.21	11.3	3.38	1.80	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	−0.04
	Steel	−0.02
	Cu	+0.06
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L yellow
	Steel	Blue
	Cu	Gold
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	72+ hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 326-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-8 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.24	–	3.26	0.23	
24 hr	13.22	−0.2	3.34	1.79	
40 hr	14.83	+12.0	3.53	1.77	
48 hr	14.95	+12.9	3.54	2.11	
64 hr	15.26	+15.3	3.60	2.56	
72 hr	15.67	+18.4	3.65	3.44	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.02
	Ag	−0.02
	Steel	−0.02
	Cu	−0.28
	Mg	+0.04
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L yellow
	Steel	Blue
	Cu	L pitting
	Mg	L brown

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	70 hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 326-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-19 AT 392°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.49	–	3.21	0.12	
24 hr	14.56	16.6	3.48	1.42	
40 hr	13.48	7.9	3.39	2.94	
48 hr	13.57	8.6	3.41	3.52	
64 hr	13.81	10.6	3.44	3.87	
72 hr	13.87	11.0	3.46	3.68	6

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	0.00
	Steel	+0.04
	Cu	−0.02
	Mg	+0.02
Metal discol ation, deposits, pitting, or etching:	Al	L yellow
	Ti	L brown
	Ag	L yellow
	Steel	Blue
	Cu	Gold
	Mg	L brown

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	None
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Breakpoint Data

Neut. no.	72+ hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	392
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 327-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-60-18 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.13	–	3.17	0.19	
24 hr	12.97	6.9	3.33	2.22	
40 hr	13.38	10.3	3.38	5.95	
48 hr	14.84	22.3	3.60	12.61	
64 hr	19.74	62.7	4.36	24.6	
72 hr	23.41	93.0	4.92	29.9	7

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.73
	Ti	+0.34
	Ag	+0.30
	Steel	+0.36
	Cu	−0.45
	Mg	+0.06
Metal discoloration, deposits, pitting, or etching:	Al	Brown deposit
	Ti	Brown deposit
	Ag	Brown deposit
	Steel	Brown deposit
	Cu	L etching
	Mg	Brown

Test Cell Data

Sludge in oil:	200-mesh filter	0.1
	Centrifuge, vol %	None
Tube deposits:	Below oil level	M & H var
	At and above oil level	M & H var

Breakpoint Data

Neut. no.	18 hr
100°F vis	41 hr

Test Conditions

Sample temperature, °F	401
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 327-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-31 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.40	–	3.23	0.08	
24 hr	14.46	7.9	3.41	1.11	
40 hr	14.89	11.1	3.48	1.28	
48 hr	15.10	12.7	3.54	1.47	
64 hr	15.42	15.1	3.55	1.84	
72 hr	15.70	17.2	3.61	2.09	3

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.04
Ti	−0.04
Ag	+0.04
Steel	+0.04
Cu	−0.06
Mg	−12.1

Metal discoloration, deposits, pitting, or etching:

Al	No change
Ti	L brown
Ag	L brown
Steel	Blue-green
Cu	Gold
Mg	H pitting & M etching

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	72+ hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	401
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 327-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-19 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.49	–	3.21	0.12	
24 hr	13.34	6.8	3.36	2.56	
40 hr	13.67	9.4	3.42	3.94	
48 hr	13.80	10.5	3.44	4.27	
64 hr	14.00	12.1	3.45	4.71	
72 hr	14.19	13.6	3.50	5.33	5

Metal Specimen Data

Weight change, mg/cm²:

Al	+0.02
Ti	−0.02
Ag	+0.06
Steel	0.00
Cu	0.00
Mg	−0.02

Metal discoloration, deposits, pitting, or etching:

Al	L brown
Ti	L brown
Ag	L brown
Steel	Purple-blue
Cu	Gold
Mg	L brown

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	L var

Breakpoint Data

Neut. no.	71 hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	401
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 327-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-21 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	12.92	-	3.15	0.14	
24 hr	14.01	8.4	3.33	1.11	
40 hr	14.31	10.8	3.37	1.47	
48 hr	14.44	11.8	3.40	1.51	
64 hr	14 77	14.3	3.44	1.71	
72 hr	15.01	16.2	3.48	2.33	4

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.04
	Ti	0.00
	Ag	+0.02
	Steel	−0.04
	Cu	−0.08
	Mg	+0.06
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	No change
	Steel	L green
	Cu	L yellow
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	71 hr
100°F vis	72+ hr

Test Conditions

Sample temperature, °F	401
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 327-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-24 AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.04	-	3.47	1.24	
24 hr	13.13	0.7	3.43	2.87	
40 hr	13.86	6.3	3.49	10.24	
48 hr	15.39	18.0	3.72	15.99	
64 hr	19.99	53.3	4.44	27.7	
72 hr	24.22	85.7	5.16	34.6	10

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.04
	Ti	−0.02
	Ag	−0.08
	Steel	−0.10
	Cu	−0.36
	Mg	−15.5
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L brown
	Steel	L purple
	Cu	L etching
	Mg	H pitting & etching

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	15 hr
100°F vis	40 hr

Test Conditions

Sample temperature, °F	401
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 327-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON L-1136[a] AT 401°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.04	–	4.13	0.16	
24 hr	15.20	−5.2	3.86	2.19	
40 hr	17.01	+6.0	3.97	13.65	
48 hr	19.08	+19.0	4.31	18.53	
64 hr	25.07	+56.3	5.27	26.1	
72 hr	30.57	+90.6	6.18	32.0	10

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.06
	Ti	0.00
	Ag	−0.02
	Steel	−0.02
	Cu	−4.12
	Mg	−5.52
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	Blue
	Ag	L yellow
	Steel	L green
	Cu	M pitting & L etching
	Mg	H pitting

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	Trace
Tube deposits:	Below oil level	L var
	At and above oil level	M & H var

Breakpoint Data

Neut. no.	17 hr
100°F vis	34 hr

Test Conditions

Sample temperature, °F	401
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Blend (1:1) of O-67-7 and O-67-9.

TEST NO. 328-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON MLO-62-1011 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.73	–	3.36	0.02	
72 hr	16.32	10.8	3.62	1.68	
120 hr	19.85	34.8	4.19	6.16	
168 hr	38.33	160	7.50	14.33	11

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.79
	Ti	+0.51
	Ag	+0.39
	Steel	+0.37
	Cu	−0.41
	Mg	–
Metal discoloration, deposits, pitting, or etching:	Al	Brown deposit
	Ti	Black deposit
	Ag	Brown deposit
	Steel	Black deposit
	Cu	L etching
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	10.4
Tube deposits:	Below oil level	H var & L carbon
	At and above oil level	None

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 328-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON MLO-62-1011 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.73	–	3.36	0.02	
72 hr	20.07	36.3	4.28	5.39	
120 hr	40.34	174	7.52	15.61	
168 hr	(a)	–	(a)	22.8	17

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.16
	Ti	0.00
	Ag	+0.04
	Steel	−0.06
	Cu	−0.18
	Mg	(b)
Metal discoloration, deposits, pitting, or etching.	Al	L brown
	Ti	No change
	Ag	L yellow
	Steel	Brown
	Cu	Brown
	Mg	(b)

Test Cell Data

Sludge in oil:	200-mesh filter	(a)
	Centrifuge, vol %	(a)
Tube deposits:	Below oil level	M var
	At and above oil level	H carbon

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

(a) Semisolid; analysis not possible.
(b) Specimen desroyed.

TEST NO. 329-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON MLO-62-1011 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.73	–	3.36	0.02	
16 hr	15.14	2.8	3.43	0.47	
24 hr	15.34	4.1	3.46	0.59	
40 hr	15.82	7.4	3.55	0.84	
48 hr	16.04	8.9	3.58	1.22	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	−0.06
	Ag	0.00
	Steel	+0.04
	Cu	−1.4
	Mg	–
Metal discoloration, deposits, pitting, or etching.	Al	No change
	Ti	L yellow
	Ag	L yellow
	Steel	Blue
	Cu	L etching
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	0.4
Tube deposits:	Below oil level	L var
	At and above oil level	L & M var

Test Conditions

Sample temperature, °F	428
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO 329-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON MLO-62-1012 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	26.86	-	5.33	0.37	
16 hr	30.58	13.8	5.70	1.91	
24 hr	32.03	19.2	5.88	28.1	
40 hr	35.17	30.9	6.28	29.1	
48 hr	37.52	39.7	6.57	37.6	5

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	+0.02	Sludge in oil:	200-mesh filter	Trace
	Ti	−0.06		Centrifuge, vol %	0.6
	Ag	0.00			
	Steel	+0.04	Tube deposits:	Below oil level	L var
	Cu	−7.67		At and above oil level	M & H var
	Mg	–			
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Test Conditions		
	Ti	L brown	Sample temperature, °F		428
	Ag	L yellow	Sample volume, ml		200
	Steel	Green	Air rate, liter/hr		10
	Cu	H etching	Condensate return		Yes
	Mg	–			

TEST NO. 329-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-65-44 AT 428°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.17		4.27	0.27	
16 hr	15.18	−6.1	3.90	4.35	
24 hr	15.47	−4.3	3.89	12.76	
40 hr	21.12	+30.6	5.09	14.76	
48 hr	69.81	+332	18.53	15.89	6

Metal Specimen Data			Test Cell Data		
Weight change, mg/cm²:	Al	+0.02	Sludge in oil:	200-mesh filter	Trace[a]
	Ti	0.00		Centrifuge, vol %	40.0
	Ag	+0.08			
	Steel	+0.06	Tube deposits:	Below oil level	L var
	Cu	−5.48		At and above oil level	M & H var
	Mg				
Metal discoloration, deposits, pitting, or etching:	Al	L brown	Test Conditions		
	Ti	Blue	Sample temperature, °F		428
	Ag	L brown	Sample volume, ml		200
	Steel	Yellow	Air rate, liter/hr		10
	Cu	H etching	Condensate return		Yes
	Mg	–			

(a) Coagulated upon filtration.

TEST NO. 330-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON G-1033 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	351.6		13.02	0.03	
16 hr	475.2	35.2	14.76	0.25	
24 hr	629.4	79.0	16.77	0.27	
40 hr	1154	228	22.42	0.27	
48 hr	1574	348	26.30	0.40	3

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	+0.04	+0.04
	Ti	0.00	0.00
	Ag	−0.36	−0.41
	Steel	+0.02	−0.06
	Cu	−0.95	−1.54
	Mg	+0.04	−0.06
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	
	Ti	L yellow	
	Ag	L etching	
	Steel	Black	
	Cu	L etching	
	Mg	No change	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions	
Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 330-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON G-1033 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	351.6		13.02	0.03	
16 hr	471.5	34.1	14.69	0.28	
24 hr	611.4	73.9	16.60	0.34	
40 hr	1100	213	21.93	0.33	
48 hr	1502	327	25.65	0.34	2

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	+0.06	+0.06
	Ti	+0.04	+0.04
	Ag	+0.02	−0.08
	Steel	+0.02	−0.04
	Cu	−1.24	−1.58
	Mg	+0.06	−0.12
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	
	Ti	Yellow-brown	
	Ag	Black	
	Steel	Black	
	Cu	L etching	
	Mg	L brown	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions	
Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 330-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON F-1041 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5	—	12.88	0.00	
16 hr	475.6	34.2	14.75	0.35	
24 hr	597.3	68.5	16.38	0.34	
40 hr	1062	200	21.52	0.34	
48 hr	1460	312	25.29	0.31	3

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	+0.04	+0.04
	Ti	0.00	0.00
	Ag	-0.36	-0.36
	Steel	0.00	-0.10
	Cu	-1.03	-1.60
	Mg	+0.10	-0.16
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	
	Ti	L yellow	
	Ag	L etching	
	Steel	Black	
	Cu	L etching	
	Mg	L brown	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L & M var

Test Conditions	
Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 330-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON F-1041 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5	—	12.88	0.00	
16 hr	474.8	33.9	14.70	0.36	
24 hr	626.8	76.8	16.72	0.34	
40 hr	1128	218	22.08	0.31	
48 hr	1558	339	26.17	0.53	3

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	+0.06	+0.06
	Ti	+0.02	+0.02
	Ag	-0.36	-0.47
	Steel	+0.04	-0.10
	Cu	-0.99	-1.54
	Mg	+0.02	-0.14
Metal discoloration, deposits, pitting, or etching:	Al	L yellow	
	Ti	L yellow	
	Ag	L etching	
	Steel	Black	
	Cu	L pitting	
	Mg	L brown	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions	
Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 330-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6		13.02	0.01	
16 hr	388.3	8.6	13.45	0.20	
24 hr	395.9	10.7	13.60	0.20	
40 hr	407.5	14.0	13.76	0.13	
48 hr	411.9	15.2	13.87	0.12	3

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	+0.04	+0.04
	Ti	+0.04	+0.04
	Ag	-0.06	-0.10
	Steel	0.00	-0.04
	Cu	-0.04	-0.37
	Mg	-0.02	-0.18
Metal discoloration, deposits, pitting, or etching:	Al	No change	
	Ti	L yellow	
	Ag	No change	
	Steel	Black	
	Cu	L pitting	
	Mg	No change	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions	
Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 330-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6	–	13.02	0.01	
16 hr	387.3	8.3	13.42	0.16	
24 hr	394.6	10.3	13.56	0.10	
40 hr	407.9	14.1	13.76	0.12	
48 hr	411.8	15.2	13.86	0.12	2

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	+0.02	+0.02
	Ti	0.00	0.00
	Ag	-0.06	-0.06
	Steel	+0.04	0.00
	Cu	-0.10	-0.47
	Mg	-0.02	-0.16
Metal discoloration, deposits, pitting, or etching:	Al	No change	
	Ti	L yellow	
	Ag	No change	
	Steel	Black	
	Cu	L pitting	
	Mg	No change	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions	
Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 331-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON G-1033 At 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	351.6	–	13.02	0.03	
16 hr	473.1	34.6	14.75	0.11	
24 hr	601.3	71.0	16.50	0.17	
40 hr	1064	203	21.47	0.65	
48 hr	1476	320	25.31	0.50	3

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	+0.04	-0.06
	Ti	-0.04	-0.08
	Ag	-0.28	-0.75
	Steel	+0.04	-0.12
	Cu	-1.05	-1.44
	Mg	-0.02	-0.06
Metal discoloration, deposits, pitting, or etching:	Al	No change	
	Ti	L yellow	
	Ag	L etching	
	Steel	No change	
	Cu	L etching	
	Mg	Gray	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions	
Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 331-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON G-1033 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	351.6	–	13.02	0.03	
16 hr	475.8	35.3	14.77	0.07	
24 hr	628.6	78.8	16.81	0.45	
40 hr	[illegible].95	240	22.72	0.67	
48 hr	1699	383	27.12	0.66	2

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	+0.02	-0.06
	Ti	+0.04	0.00
	Ag	-0.22	-0.69
	Steel	+0.08	-0.08
	Cu	-1.20	-1.52
	Mg	+0.04	-0.18
Metal discoloration, deposits, pitting, or etching:	Al	No change	
	Ti	L yellow	
	Ag	L etching	
	Steel	No change	
	Cu	L etching	
	Mg	No change	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions	
Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 331-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON F-1041 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5	–	12.88	0.00	
16 hr	473.6	33.6	14.72	0.11	
24 hr	609.4	71.9	16.56	0.50	
40 hr	1080	205	21.86	0.48	
48 hr	1545	336	25.90	0.53	3

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	0.00	-0.10
	Ti	+0.02	-0.06
	Ag	-0.18	-0.77
	Steel	+0.04	-0.12
	Cu	-1.18	-1.46
	Mg	-0.04	-0.14
Metal discoloration, deposits, pitting, or etching:	Al	No change	
	Ti	L yellow	
	Ag	L etching	
	Steel	No change	
	Cu	L etching	
	Mg	No change	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions	
Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 331-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON F-1041 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	354.5	–	12.88	0.00	
16 hr	474.9	34.0	14.70	0.08	
24 hr	612.1	72.7	16.57	0.53	
40 hr	1114	214	21.91	0.72	
48 hr	1534	333	25.85	0.75	3

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	+0.02	-0.04
	Ti	0.00	0.00
	Ag	-0.32	-0.43
	Steel	+0.02	-0.14
	Cu	-1.01	-1.40
	Mg	-0.06	-0.14
Metal discoloration, deposits, pitting, or etching:	Al	No change	
	Ti	L yellow	
	Ag	L etching	
	Steel	No change	
	Cu	L etching	
	Mg	No change	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions	
Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 331-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6	–	13.02	0.01	
16 hr	390.3	9.1	13.48	0.04	
24 hr	396.0	10.7	13.60	0.13	
40 hr	408.4	14.2	13.79	0.12	
48 hr	412.3	15.3	13.87	0.13	2

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	−0.02	−0.04
	Ti	0.00	−0.06
	Ag	+0.04	−0.26
	Steel	−0.02	−0.08
	Cu	−0.20	−0.53
	Mg	−0.10	−0.16
Metal discoloration, deposits, pitting, or etching:	Al	No change	
	Ti	L yellow	
	Ag	L etching	
	Steel	No change	
	Cu	L etching	
	Mg	No change	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions	
Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 331-6. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-67-1 AT 608°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	357.6	–	13.02	0.01	
16 hr	390.3	9.1	13.46	0.06	
24 hr	395.0	10.5	13.58	0.19	
40 hr	408.7	14.3	13.79	0.20	
48 hr	412.8	15.4	13.85	0.14	3

Metal Specimen Data		Normal Cleaning	Electro-cleaning
Weight change, mg/cm²:	Al	−0.02	−0.02
	Ti	+0.04	0.00
	Ag	+0.02	−0.24
	Steel	−0.02	−0.08
	Cu	−0.24	−0.45
	Mg	−0.06	−0.10
Metal discoloration, deposits, pitting, or etching:	Al	No change	
	Ti	L yellow	
	Ag	L etching	
	Steel	No change	
	Cu	L etching	
	Mg	No change	

Test Cell Data		
Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Test Conditions	
Sample temperature, °F	608
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 333-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON MLO-62-1011 AT 464°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.73	–	3.36	0.02	
16 hr	15.35	4.2	3.45	1.13	
24 hr	15.67	6.4	3.51	1.29	
40 hr	16.58	12.6	3.64	2.31	
48 hr	17.98	22.1	3.85	5.71	4

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.22
	Ti	+0.16
	Ag	+0.20
	Steel	+0.18
	Cu	+0.16
	Mg	–
Metal discoloration, deposits, pitting, or etching:	Al	Brown deposit
	Ti	Brown
	Ag	Brown deposit
	Steel	Black
	Cu	Black
	Mg	–

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	1.0
Tube deposits:	Below oil level	H var & L carbon
	At and above oil level	None

Test Conditions

Sample temperature, °F	464
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 334-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-829 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.88	–	3.47	0.27	
16 hr	14.19	2.2	3.52	0.81	
24 hr	14.27	2.8	3.54	1.02	
40 hr	14.33	3.2	3.55	1.47	
48 hr	14.34	3.3	3.55	1.77	2

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.04
	Ti	+0.04
	Ag	+0.02
	Steel	0.00
	Cu	–0.14
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L yellow
	Ag	L yellow
	Steel	Blue
	Cu	L brown
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 334-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-830 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.62	–	3.39	0.80	
16 hr	13.95	2.4	3.46	1.07	
24 hr	14.07	3.3	3.47	1.30	
40 hr	14.94	9.7	3.63	3.61	
48 hr	17.44	28.0	4.03	9.68	2

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.06
	Ti	0.00
	Ag	−0.02
	Steel	+0.02
	Cu	−0.06
	Mg	+0.04
Metal discoloration, deposits, pitting, or etching:	Al	L yellow
	Ti	L yellow
	Ag	L yellow
	Steel	Blue
	Cu	L brown
	Mg	L yellow

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	2.0
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	30 hr
100°F vis	40 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 334-3. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-831 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	14.52	–	3.48	0.28	
16 hr	15.60	7.4	3.65	0.58	
24 hr	15.66	7.9	3.67	0.78	
40 hr	15.86	9.2	3.70	0.94	
48 hr	15.60	7.4	3.71	1.01	3

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	0.00
	Ag	+0.02
	Steel	0.00
	Cu	−0.08
	Mg	+0.06
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L yellow
	Ag	L brown
	Steel	L blue
	Cu	L brown
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	0.6
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 334-4. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-832 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.76	–	3.37	0.31	
16 hr	14.53	5.6	3.49	0.50	
24 hr	14.67	6.6	3.52	0.74	
40 hr	14.88	8.1	3.55	0.83	
48 hr	14.92	8.4	3.56	1.10	3

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	+0.04
	Ag	0.00
	Steel	+0.02
	Cu	0.00
	Mg	+0.02
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L yellow
	Ag	L brown
	Steel	Blue
	Cu	L brown
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	Trace
	Centrifuge, vol %	0.4
Tube deposits:	Below oil level	None
	At and above oil level	L var

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 334-5. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-5 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	16.27	–	4.01	0.20	
16 hr	16.79	3.2	4.06	0.42	
24 hr	16.90	3.9	4.07	0.70	
40 hr	16.99	4.4	4.05	0.77	
48 hr	16.96	4.2	4.04	1.03	0

Metal Specimen Data

Weight change, mg/cm²:	Al	−0.06
	Ti	0.00
	Ag	−0.14
	Steel	0.00
	Cu	−0.04
	Mg	+0.04
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L yellow
	Ag	L yellow
	Steel	Blue
	Cu	Gold
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 335-1. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON O-68-6 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.10	–	3.19	0.29	
16 hr	13.88	6.0	3.32	1.14	
24 hr	14.13	7.9	3.36	1.39	
40 hr	15.63	19.3	3.57	4.89	
48 hr	17.63	34.6	3.85	9.43	4

Metal Specimen Data

Weight change, mg/cm²:	Al	0.00
	Ti	+0.04
	Ag	0.00
	Steel	0.00
	Cu	−0.69
	Mg	0.04
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L yellow
	Steel	Blue
	Cu	L pitting
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	None

Breakpoint Data

Neut. no.	26 hr
100°F vis	36 hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

TEST NO. 335-2. RESULTS OF REFLUX OXIDATION-CORROSION TEST ON ATL-833 AT 385°F

	Vis, cs/100°F	100°F Vis Increase, %	Vis, cs/210°F	Neut. No., mg KOH/g	Oil Loss, wt %
Initial	13.53	–	3.48	2.22	
16 hr	13.77	1.8	3.52	3.13	
24 hr	13.88	2.6	3.54	3.55	
40 hr	14.04	3.8	3.56	4.01	
48 hr	14.10	4.2	3.56	4.35	3

Metal Specimen Data

Weight change, mg/cm²:	Al	+0.02
	Ti	0.00
	Ag	0.00
	Steel	0.00
	Cu	−0.14
	Mg	0.00
Metal discoloration, deposits, pitting, or etching:	Al	No change
	Ti	L brown
	Ag	L yellow
	Steel	L brown
	Cu	L brown
	Mg	No change

Test Cell Data

Sludge in oil:	200-mesh filter	None
	Centrifuge, vol %	None
Tube deposits:	Below oil level	None
	At and above oil level	

Breakpoint Data

Neut. no.	48+ hr
100°F vis	48+ hr

Test Conditions

Sample temperature, °F	385
Sample volume, ml	200
Air rate, liter/hr	10
Condensate return	Yes

UNCLASSIFIED
Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY *(Corporate author)*
Southwest Research Institute
8500 Culebra Road
San Antonio, Texas 78228

2a. REPORT SECURITY CLASSIFICATION
UNCLASSIFIED

2b. GROUP

3. REPORT TITLE
EVALUATION STUDY OF THE OXIDATION-CORROSION CHARACTERISTICS OF AIRCRAFT TURBINE ENGINE LUBRICANTS

4. DESCRIPTIVE NOTES *(Type of report and inclusive dates)*
Phase Report, February 1, 1969 through December 15, 1969

5. AUTHOR(S) *(First name, middle initial, last name)*
J. P. Cuellar
B. B. Baber

6. REPORT DATE	7a. TOTAL NO. OF PAGES	7b. NO. OF REFS
May 1970	227	None

8a. CONTRACT OR GRANT NO.	9a. ORIGINATOR'S REPORT NUMBER(S)
F33615-69-C-1295	
b. PROJECT NO. 3048	RS-546
c.	9b. OTHER REPORT NO(S) *(Any other numbers that may be assigned this report)*
d.	AFAPL-TR-70-10, Volume II

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11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY
	Air Force Aero Propulsion Laboratory Air Force Systems Command Wright-Patterson Air Force Base, Ohio

13. ABSTRACT

Volume II of this report contains a compilation of the individual test data sheets for all tests reported in Volume I. The data sheets are presented in the order of test number.

DD FORM 1 NOV 68 1473

UNCLASSIFIED
Security Classification

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Lubricants Oxidation-Corrosion Aircraft Turbine Engines Test Methods						