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Volume II

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FRACTURE MECHANICS EVALUATION OF B-1 MATERIALS

Volume II
FATIGUE CRACK GROWTH DATA

ROCKWELL INTERNATIONAL
B-1 DIVISION
LOS ANGELES, CALIFORNIA

OCTOBER 1976

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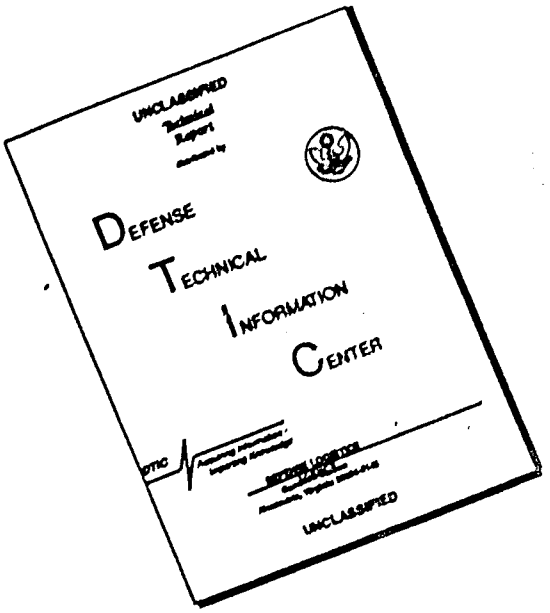

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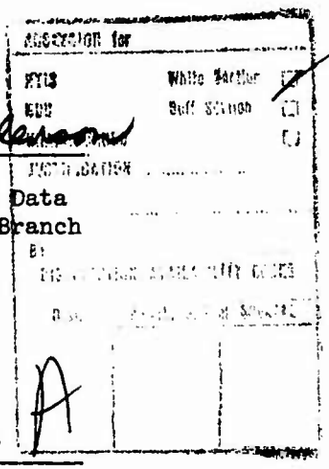

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17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

18. SUPPLEMENTARY NOTES

This report was prepared to document the materials evaluation efforts required to support the application of Fracture Mechanics Design Methodology to the B-1 Strategic Bomber.

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

Fracture Mechanics — Crack Growth

Fracture Toughness — Stress Corrosion

Materials Evaluation

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

A total of 1764 fracture mechanics tests ~~- K_{Ic}, K_c, K_{Iscc}, and da/dN~~ were conducted on fourteen alloys to develop property data for use in the B-1 design. Tests were performed on aluminum alloys 2024, 2124, 2219, 7049, 7050, 7075 and 7175; titanium alloy Ti-6Al-4V; steel alloys 9Ni-4Co-.20C, 9Ni-4Co-.30c and 300M; corrosion resistant steel PH13-8Mo; nickel alloy Inconel 718; and nickel-cobalt alloy MP 35 N. The effects of product form, heat-to-heat variability, grain orientation, and heat treat condition on fracture behavior were investigated. ~~In addition, the~~ fracture properties

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of welds in Ti-6Al-4V, PH13-8Mo and 9-4-.20 alloys and of diffusion bonds in Ti-6Al-4V were determined. Testing variables were temperature, specimen thickness, environment, cyclic frequency and R-factor for the da/dN tests; temperature and specimen thickness for the K_c tests; temperature for the K_{Ic} tests; and environment for the K_{Iscc} tests.

The results of the tests are presented in tables and graphs in detailed and summarized forms. The effects of the various material and testing variables on fracture behavior are discussed.

FOREWORD

This work was performed by Rockwell International under USAF Contract No. F33657-70-C-0800 in support of the application of fracture mechanics design requirement to the B-1 Strategic Bomber. The Air Force review team which directed this activity was headed by Mr. C. F. Tiffany, ASD/ENF and included the following personnel:

Mr. B. R. Meadows	B-1 SPO
Sgt. R. Bullock	B-1 SPO
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Mr. N. G. Tupper	AFML/LLS
MR. A. W. Gunderson	AFML/MXE

The Rockwell International personnel primarily involved in this test effort included Mr. N. Klimmek, Dr. A. Summers, Mr. W. Padian, Mr. R. Ferguson, Mr. M. Katcher, Dr. L. Kasher, Mr. M. Harrigan, and Mr. J. Young, all of the Materials and Producibility Croup, and Mr. G. Fitch of the Fatigue and Fracture Design Group.

The body of the report was assembled by Rockwell International as NA-74-862 to document this significant testing effort. Because of the wide scope of materials included and the general interest in the fracture mechanics data it was deemed appropriate to provide a wider distribution by releasing this document as an Air Force Materials Laboratory Technical Report.

The test program was conducted from December 1970 to December 1974. Testing in the program was performed by the Rockwell International Laboratories, Los Angeles, California; by the Air Force Materials Laboratory, WPAFB, Ohio; by the University of Dayton Research Institute, Dayton, Ohio; by the Lockheed California Company, Saugus, California, and by General Dynamics, Fort Worth, Texas.

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INTRODUCTION

1.0 The fatigue crack growth rate data developed under this program is presented in this volume; organized by alloy type. A summary of the overall program is shown in Table I. A brief explanation of the specimen identification and program outline follows but for specific details of the testing procedures the reader is referred to Volume I. The data reduction technique used in the da/dN plots was the point to point method using the midspan crack length for the stress intensity calculation.

2.0 MATERIAL AND SPECIMEN IDENTIFICATION SYSTEM

Tests were conducted on over 90 lots of alloy in the program. As each lot of material was received it was assigned a material number, which became the first number in the identification system of each specimen fabricated from that lot. The specimen numbering system, described below, provided precise traceability back to the specimen location in the original lot of material.

Material Number (lot identification number)	Type of Test K = K_{Ic} or K_c N = da/dN E = K_{Iscc}	Specimen Orientation (Figure 2.1-1)	Identifies specimen location within a material lot (piece number on layout drawing)

For weldments, the specimen orientation is that of the parent metal in the specimen. For diffusion bond joints, two specimen orientations are shown in the specimen number separated by a slash number (e.g., RW/TR) to show the orientation of the parent metal on each side of the joint.

3.0 ENVIRONMENTS

Ten test environments were used in this program:

(1) Laboratory Air (LA) - The environment contained within the test facility, without control on humidity.

(2) Low Humidity Air (LHA) - A dry air environment of 10% or less relative humidity, as obtained by sealing the crack propagation zone within an enclosure containing freshly dried desiccant.

(3) 100% Humidity Air (100% Hum.) - A moist air environment obtained by sealing the crack propagation zone within an enclosure partially filled with commercially available distilled water. The liquid was not allowed to rise to the level of the crack propagation zone.

(4) Distilled Water (Dist H_2O) - A liquid environment of commercially available distilled water.

(5) Fuel Tank Sump Residue Water (STW) - A liquid environment of a .12% metal chloride solution consisting of distilled water with the following additions:

$CaCl_2$	50 PPM	$CrCl_3 \cdot 6H_2O$		1 PPM
$CdCl_2$	1000 PPM	$CuCl_3 \cdot 2H_2O$		1 PPM
$MgCl_2$	50 PPM	$FeCl_3$		5 PPM
NaCl	100 PPM	$MnCl_2 \cdot 4H_2O$		5 PPM
$ZnCl_2$	10 PPM	$NiCl_2 \cdot 6H_2O$		1 PPM
$PbCl_2$	1 PPM			

(6) Field Cleaning Solvent (FCS) - A liquid environment of a trisodium phosphate type cleaning solution consisting of 1 part MIL-C-25769 material to 8 parts water by volume.

(7) Shop Cleaning Solvent (SCS) - A liquid environment of an aliphatic naphtha per specification TT-N-95.

(8) Freon TF (FTF) - A liquid environment of a commonly used metal cleaning agent, Trichlorotrifluoroethane.

(9) Fuel - A liquid environment of JP-4 jet fuel saturated with distilled water.

(10) 90% Fuel + 10% Sump Tank Water (JP4 & STW) - A cyclic liquid environment of sump tank water then jet fuel, per (5) and (9) above. One complete environmental cycle consisted of 1.6 hours in STW followed by 14.4 hours in JP-4. Environmental cycling was continued throughout the duration of each test.

Da/DN testing was conducted in all ten environments, while K_{Iscc} testing was conducted only in STW, FCS, and SCS environments (numbers (5), (6), and (7). All K_{Ic} and K_c testing was conducted in a laboratory air environment (LA).

Environments (4) through (10) applied to FCGR specimens by means of clear plastic chambers enclosing the crack propagation zone of the specimen. The chambers were equipped with inlet and outlet parts which allowed the liquid to flow through by gravity differential. In K_{Iscc} testing, the specimens were immersed vertically in the liquid environments to just below the level of the loading bolts.

Table 1

FRACTURE MECHANICS MATERIAL TEST PROGRAM SUMMARY

Materials	No. of Lots of Indicated Product Form					Number of Tests								Total Specimens
						K_{Ic}		K_c		K_{Iscc}	ΔK vs. da/dN			
	Sheet	Plate	Extrusion	Rolled or Forged Bar	Forging	CT	PTC	CT	CCT	DCB	CT	CCT	PTC	
Ti-6Al-4V	2	23	2		4	184	-	24	8	63	122	9	-	410
Ti-6Al-4V GTA Weld	1	6	1			11	38	-	2	29	5	2	36	123
2024/2124	2	8			2	86	-	17	11	19	55	16	-	204
2219		6	1		1	56	-	9	-	15	40	-	-	120
7075-T76xxx	2	5	1			50	-	10	5	9	25	8	-	107
7075-T73xxx			2		1	30	-	14	-	8	31	-	-	83
7049					3	10	-	4	-	13	14	-	-	41
7175					2	10	-	-	-	12	18	-	-	40
7050		1			1	12	-	-	-	2	6	-	-	20
HP-9Ni-4Co-0.20C		2		6	3	99	-	10	-	20	40	-	-	169
HP-9-4-20 GTA Weld		2			1	5	27	-	-	12	7	-	20	71
HP-9Ni-4Co-0.30C				2		32	-	-	-	-	20	-	-	52
PH13-8Mo			1	5	1	83	-	14	-	47	35	-	-	179
PH13-8Mo GTA Weld			1	1		8	14	-	-	21	4	-	8	55
300M					1	15	-	-	-	12	17	-	-	44
Inconel 718				1	1	20	-	-	-	8	14	-	-	42
MP35N				1		1	-	-	-	3	-	-	-	4
Total Specimens/Category						712	79	102	26	293	453	35	64	1,764

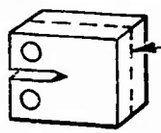
APPENDIX A

FATIGUE CRACK GROWTH RATE CURVES FOR ALL Ti-6Al-4V ALLOY TESTS (EXCLUDING WELDMENTS)

APPENDIX A: INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No
DBTC	61 NRW 3-3	RW	6.0	0.6	0.5	LHA	R.T.	0.3	60	A-1
DB *	61 NWR 3-4	WR	6.0	0.6	1.0	LHA	R.T.	0.3	360	A-2
DB *	62 NRW 4-1,-2	RW	6.0	0.6	1.0	LHA	R.T.	0.3	60	A-3
DB *	62 NRW 4-5,-6	RW	6.0	0.6	1.0	LHA	R.T.	0.3	360	A-4
M.A.	62 NRW 4-7	RW	6.0	0.6	0.7	LHA	R.T.	0.3	60	A-5
DB *	62 NRW 4-23	RW	6.0	0.6	1.0	LHA	R.T.	0.3	1800	A-6
M.A.	62 NRW 4-32	RW	6.0	0.6	0.5	LHA	R.T.	0.3	60	A-7
M.A.	62 NRW 4-33	RW	6.0	0.6	0.5	STW	R.T.	0.3	60	A-8
DBTC	62 NRW 4-34	RW	6.0	0.6	0.5	LHA	R.T.	0.3	60	A-9
DBTC	62 NRW 4-271	RW	6.0	0.6	0.5	LHA	R.T.	0.08	60	A-10
B.A.	62 NRW 4-281	RW	6.0	0.6	0.5	LHA	R.T.	0.3	60	A-11
STOA	62 NRW 4-291	RW	6.0	0.6	0.5	LHA	R.T.	0.3	60	A-12
MILL BETA PROCESSED PLUS: DBTC	63 NWR 10-10	WR	6.0	0.6	1.0	LHA	R.T.	0.3	60	A-13
DBTC	63 NRW 10-12	RW	6.0	0.6	1.0	LHA	R.T.	0.3	60	A-14
DBTC	63 NRW 10-14	RW	6.0	0.6	1.0	STW	R.T.	0.3	60	A-15
M.A.	64 NRW 11-7	RW	3.77	0.477	1.0	LHA	R.T.	0.08	360	A-16
M.A.	64 NRW 11-8	RW	3.77	0.477	1.0	STW	R.T.	0.08	60	A-17
M.A.	64 NRW 11-9	RW	3.77	0.477	1.0	JP4	R.T.	0.08	60	A-18
M.A.	64 NRW 11-10	RW	3.77	0.477	1.0	LHA	R.T.	0.08	60	A-19
M.A.	64 NRW 11-11	RW	3.77	0.477	1.0	LHA	R.T.	0.5	360	A-20
M.A.	64 NRW 11-12	RW	3.77	0.477	1.0	LHA	R.T.	0.3	360	A-21
M.A.	64 NWR 11-13	WR	3.77	0.477	1.0	LHA	R.T.	0.08	360	A-22
M.A.	64 NWR 11-14	WR	3.77	0.477	1.0	STW	R.T.	0.08	60	A-23
M.A.	66 NWR 16-1	WR	6.0	0.6	1.0	LHA	R.T.	0.3	60&360	A-24
M.A.	66 NRW 16-3	RW	6.0	0.6	1.0	LHA	R.T.	0.3	60&360	A-25
M.A.	66 NRW 16-4	RW	6.0	0.6	1.0	STW	R.T.	0.3	60	A-26
M.A.	66 NRW 16-5	RW	6.0	0.6	1.0	LHA	R.T.	0.3	60	A-27
M.A.	66 NRW 16-16	RW	6.0	0.6	1.0	STW	R.T.	0.3	60	A-28

NOTES: All figures on this page are for CT specimens.

*  Bond plane location. Orientation of the parent metal on each side of the joint was the same.

APPENDIX A: INDEX OF FIGURES

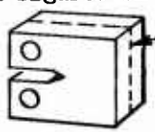
Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No
R.A.	67 NWR 29-1	WR	7.4	0.486	1.0	LHA	R.T.	0.5	360	A-29
DBTC	67 NWR 29-2	WR	7.19	0.5	1.0	STW	R.T.	0.08	60	A-30
DBTC	67 NWR 29-3	WR	7.19	0.5	1.0	LHA	R.T.	0.08	60	A-31
R.A.	67 NWR 29-4	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	A-32
R.A.	67 NWR 29-5	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-33
R.A.	67 NRW 29-8	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-34
R.A.	67 NRW 29-15	RW	7.4	0.486	1.0	STW	R.T.	0.08	6	A-35
R.A.	67 NRW 29-16	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	A-36
R.A.	67 NRW 29-17	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	A-37
R.A.	67 NRW 29-19	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	A-38
R.A.	67 NRW 29-20	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-39
R.A.	67 NRW 29-21	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-40
R.A.	67 NRW 29-38	RW	5.0	0.6	1.0	LHA	265	0.08	360	A-41
R.A.	68 NWR 32-10	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	A-42
R.A.	68 NRW 32-11	RW	7.4	0.486	1.0	STW	150	0.08	60	A-43
R.A.	68 NRW 32-12	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-44
R.A.	69 NRW 33-7	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	A-45
R.A.	70 NRW 39-13	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-46
DBTC	70 NRW 39-14	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-47
R.A.	70 NRW 40-16	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-48
R.A.	72 NRW 46-1	RW	4.0	0.6	1.38	FCS	R.T.	0.08	60	A-49
R.A.	72 NWR 46-2	WR	4.0	0.6	1.38	STW	R.T.	0.08	6	A-50
DBTC	72 NRW 46-24	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-51
DBTC	72 NRW 46-25	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-52
R.A.	72 NRW 46-26	RW	7.4	0.486	1.0	LHA	R.T.	0.08	3600	A-53
R.A.	72 NRW 46-27	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-54
R.A.	72 NRW 46-28	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	A-55
R.A.	72 NRW 46-29	RW	7.4	0.486	1.0	JP4	R.T.	0.08	60	A-56
R.A.	72 NRW 46-30	RW	7.4	0.486	1.0	STW	150	0.08	60	A-57

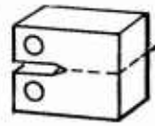
NOTE: All figures on this page are for CT specimens.

APPENDIX A: INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No
R.A.	72 NRW 46-31	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	A-58
R.A.	72 NRW 46-32	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-59
R.A.	72 NRW 46-33	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	A-60
R.A.	72 NRW 46-34	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	A-61
R.A.	72 NRW 46-35	RW	7.4	0.486	1.0	LHA	R.T.	0.7	360	A-62
R.A.	72 NRW 46-36	RW	7.4	0.486	1.0	LHA	265	0.08	360	A-63
R.A.	72 NRW 46-37	RW	7.4	0.486	1.0	LHA	-65	0.08	360	A-64
R.A.	72 NRW 46-38	RW	7.4	0.486	0.25	LHA	R.T.	0.08	360	A-65
R.A.	72 NRW 46-39	RW	7.4	0.486	0.5	LHA	R.T.	0.08	360	A-66
DBTC	72 NWR 46-40	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	A-67
R.A.	72 NWR 46-41	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	A-68
R.A.	72 NWR 46-42	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-69
R.A.	72 NWR 46-43	WR	7.4	0.486	1.0	JP4	R.T.	0.08	60	A-70
R.A.	72 NWR 46-44	WR	7.4	0.486	0.5	LHA	R.T.	0.08	360	A-71
R.A.	72 NRW 46-79	RW	7.4	0.486	0.4	STW	R.T.	0.08	60	A-72
DB *	74 NTW 52-1	TW/TW	6.0	0.6	1.0	LHA	R.T.	0.08	360	A-73
DB **	74 NTW 52-2	TW/TW	6.0	0.6	1.0	STW	R.T.	0.08	60	A-74
DB *	74 NWR 52-3	WR	6.0	0.6	1.0	STW	R.T.	0.08	60	A-75
DB **	74 NTW 52-20	TW/TW	5.0	0.486	1.0	STW	R.T.	0.08	60	A-76
DB +TR**	74 NTW 52-21	TW/TW	5.0	0.486	1.0	STW	R.T.	0.08	60	A-77
DB *	74 NWR 52-22	WR	5.0	0.486	1.0	LHA	R.T.	0.08	360	A-78
DB +2DBTC **	74 NTW 53-1A	TW/TW	5.0	0.486	1.0	LHA	R.T.	0.08	360	A-79
DB +2DBTC *	74 NWR 53-3	WR	6.0	0.6	1.0	STW	R.T.	0.08	60	A-80
DB +4DBTC **	74 NTW 54-1	TW/TW	6.0	0.6	1.0	LHA	R.T.	0.08	360	A-81
DB +4DBTC *	74 NWR 54-3	WR	6.0	0.6	1.0	STW	R.T.	0.08	60	A-82
BETA EXTR. **M.A.**	75 NRW 59-1	RW	5.0	0.486	1.0	LHA	R.T.	0.08	360	A-83
R.A.	76 NRW 61-16	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-84
R.A.	76 NRW 61-151	RW	6.0	0.6	1.0	STW	R.T.	0.08	60	A-85

NOTE: All figures on this page are for CT specimens.

*  Bond plane location. Orientation of parent metal on each side of the joint was the same.

**  Bond plane location. Orientation of the parent metal on each side of the joint is listed.

APPENDIX A: INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No
DBTC	77 NRW LA1-B	RW	7.4	0.486	0.35	STW	R.T.	0.08	60	A-86
DBT + PC	77 NWR LD12-B	WR	7.4	0.486	0.35	STW	R.T.	0.08	60	A-87
DBTC + TR	77 NWR YD1-15A	WR	5.0	0.486	1.0	STW	R.T.	0.08	60	A-88
DBTC	77 NWR YD1-15B	WR	5.0	0.486	1.0	STW+JP4	R.T.	0.08	60	A-89
DB **	77 NRW LA-1	RW/RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-90
DB **	77 NWR LD-12	WR/WR	7.4	0.486	1.0	STW	R.T.	0.08	60	A-91
R.A.	77 NRW YD1-4	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-92
R.A.	77 NWR YD1-5	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	A-93
R.A.	77 NRW YD3-4	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-94
R.A.	77 NWR YD3-5	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	A-95
R.A.	77 NRW YD3-16	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-96
R.A.	77 NWR YD3-17	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-97
R.A.	79 NRW 77-1	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	A-98
R.A.	79 NRW 77-2	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-99
R.A.	79 NRW 77-3	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	A-100
R.A.	79 NRW 77-4	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	A-101
R.A.	79 NRW 77-5	RW	7.4	0.486	0.5	STW	R.T.	0.5	60	A-102
R.A.	79 NWR 77-20	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	A-103
R.A.	79 NWR 77-21	WR	7.4	0.486	0.75	STW	R.T.	0.08	60	A-104
R.A.	79 NWR 77-22	WR	7.4	0.486	0.65	STW	R.T.	0.5	60	A-105
R.A.	79 NRW 77-23	RW	7.4	0.486	1.0	JP4	R.T.	0.08	60	A-106
R.A.	79 NRW 77-24	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-107
M.A.	80 NRW 84-5	RW			0.1	LHA	R.T.	0.08	60	A-108
M.A.	80 NRW 84-6	RW			0.1	LHA	R.T.	0.08	360	A-109
M.A.	80 NRW 84-7	RW			0.1	LHA	R.T.	0.3	360	A-110
M.A.	80 NRW 84-8	RW			0.1	LHA	R.T.	0.5	360	A-111
M.A.	80 NRW 84-9	RW			0.1	JP4	R.T.	0.08	360	A-112
M.A.	80 NRW 84-10	RW			0.1	STW	R.T.	0.08	60	A-113
M.A.	80 NWR 84-13	WR			0.1	LHA	R.T.	0.08	360	A-114
M.A.	80 NWR 84-14	WR			0.1	STW	R.T.	0.08	360	A-115
M.A.	81 NRW 94-1	RW			0.1	LHA	R.T.	0.08	360	A-116

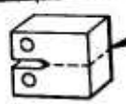
NOTE: Figures 80 NRW 84-5 through 81 NRW 94-1 are for CCT specimens, all others are for CT specimens.

** See preceding page

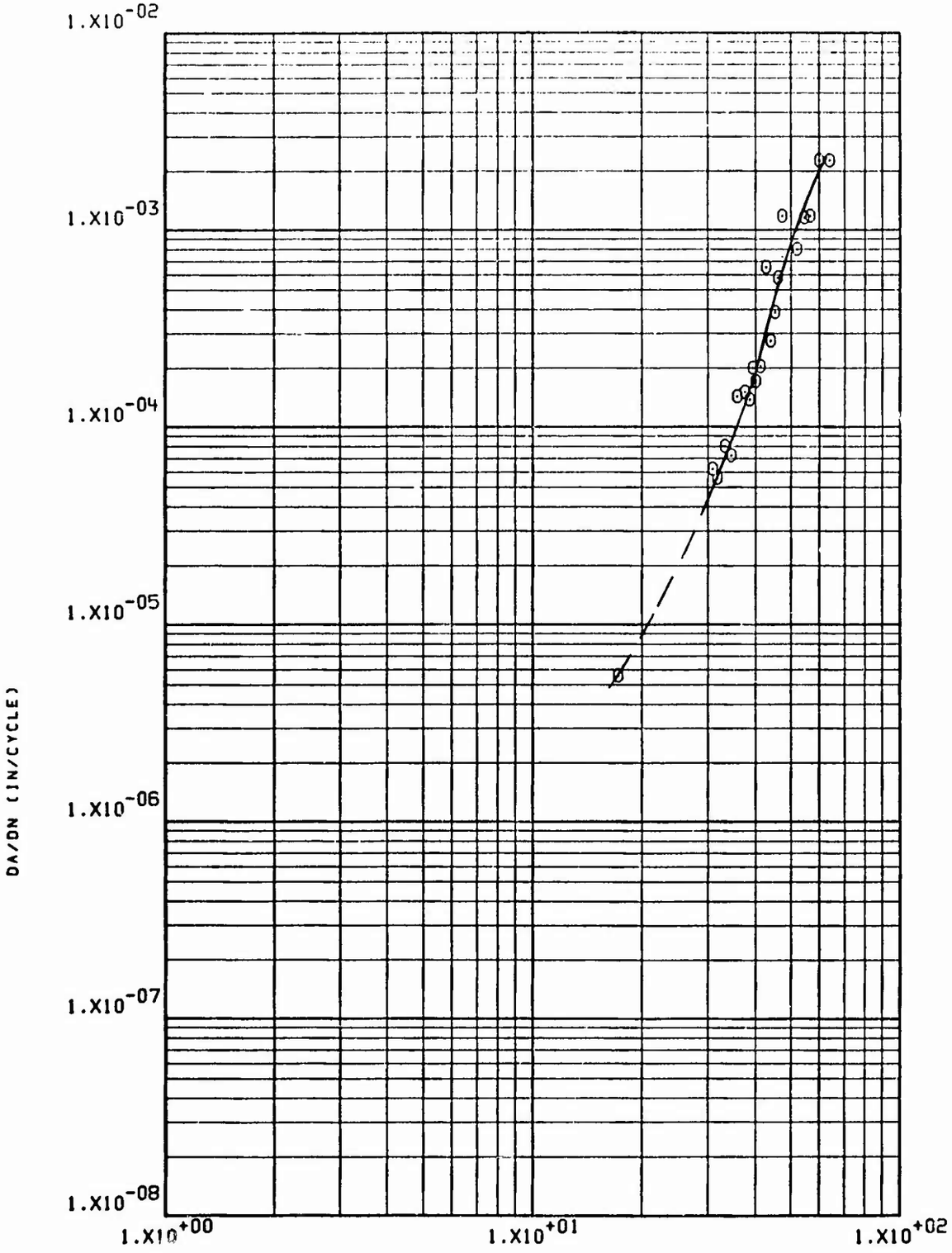
APPENDIX A: INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No
R.A.	82 NRW 95-5	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-117
R.A.	82 NWR 95-8	WR	7.4	0.486	1.0	LHA	R.T.	0.5	360	A-118
R.A.	82 NWR 95-9	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	A-119
R.A.	84 NWR 103-1	WR	6.0	0.6	1.0	STW	R.T.	0.08	60	A-120
R.A.	84 NRW 103-2	RW	6.0	0.6	1.0	STW	R.T.	0.08	60	A-121
R.A.	85 NRW 104-1	RW	6.0	0.6	0.9	STW	R.T.	0.08	60	A-122
R.A.	85 NWR 104-2	WR	6.0	0.6	0.9	STW	R.T.	0.08	60	A-123
R.A.	86 NWR 107-1	WR	7.4	0.486	0.4	STW	R.T.	0.08	60	A-124
DB **	90 NRW 032A	RW/RW	7.4	0.486	1.0	STW	R.T.	0.08	60	A-125
DB **	90 NWR 032D	WR/WR	7.4	0.486	1.0	STW	R.T.	0.08	60	A-126
R.A.	253 NRW 1020	RW	5.0	0.6	1.0	STW	R.T.	0.08	60	A-127
R.A.	294 NRW 1022	RW	5.0	0.6	1.0	STW	R.T.	0.08	60	A-128
R.A.	7406 NRW 1016A	RW	4.88	0.486	0.75	STW	R.T.	0.08	60	A-129
R. A.	7768 NRW 1017A	RW	4.88	0.486	0.75	STW	R.T.	0.08	60	A-130
	L1200021 N-1	RW or WR	3.77	0.477	0.5	STW	R.T.	0.08	60	A-131
	L1200021 N-2	RW or WR	3.77	0.477	0.5	STW	R.T.	0.08	60	A-132
	L1200021 O-3	RW or WR	3.77	0.477	0.5	STW	R.T.	0.08	60	A-133
	L1200021 O-4	RW or WR	3.77	0.477	0.5	STW	R.T.	0.08	60	A-134
DBWM.P. **	2DC3-1 NRW/TR	RW/TR	4.33	0.484	1.0	STW	R.T.	0.08	60	A-135
DBWM.P. **	2DC4-1 NRW/TR	RW/TR	4.33	0.484	1.0	STW	R.T.	0.08	60	A-136
DBWM.P. **	2DC5-1 NRW/TR	RW/TR	4.33	0.484	1.0	STW	R.T.	0.08	60	A-137
DBWH10$_2$ **	2DC6-1 NRW/TR	RW/TR	4.33	0.484	1.0	STW	R.T.	0.08	60	A-138
DBWM.P.**	3DA3-1 NWR/TR	WR/TR	4.33	0.484	1.0	STW	R.T.	0.08	60	A-139
DBWM.P.**	3DA4-1 NWR/TR	WR/TR	4.33	0.484	1.0	STW	R.T.	0.08	60	A-140
DBWM.P.**	3DA5-1 NWR/TR	WR/TR	4.33	0.484	1.0	STW	R.T.	0.08	60	A-141
DBWH10$_2$**	4DA6-1 NWR/TR	WR/TR	4.33	0.484	1.0	STW	R.T.	0.08	60	A-142

NOTE: All Figures on this page are for CT specimens.

** 

Bond plane orientation. Orientation of parent metal on each side of the joint is listed in "Direction" Column



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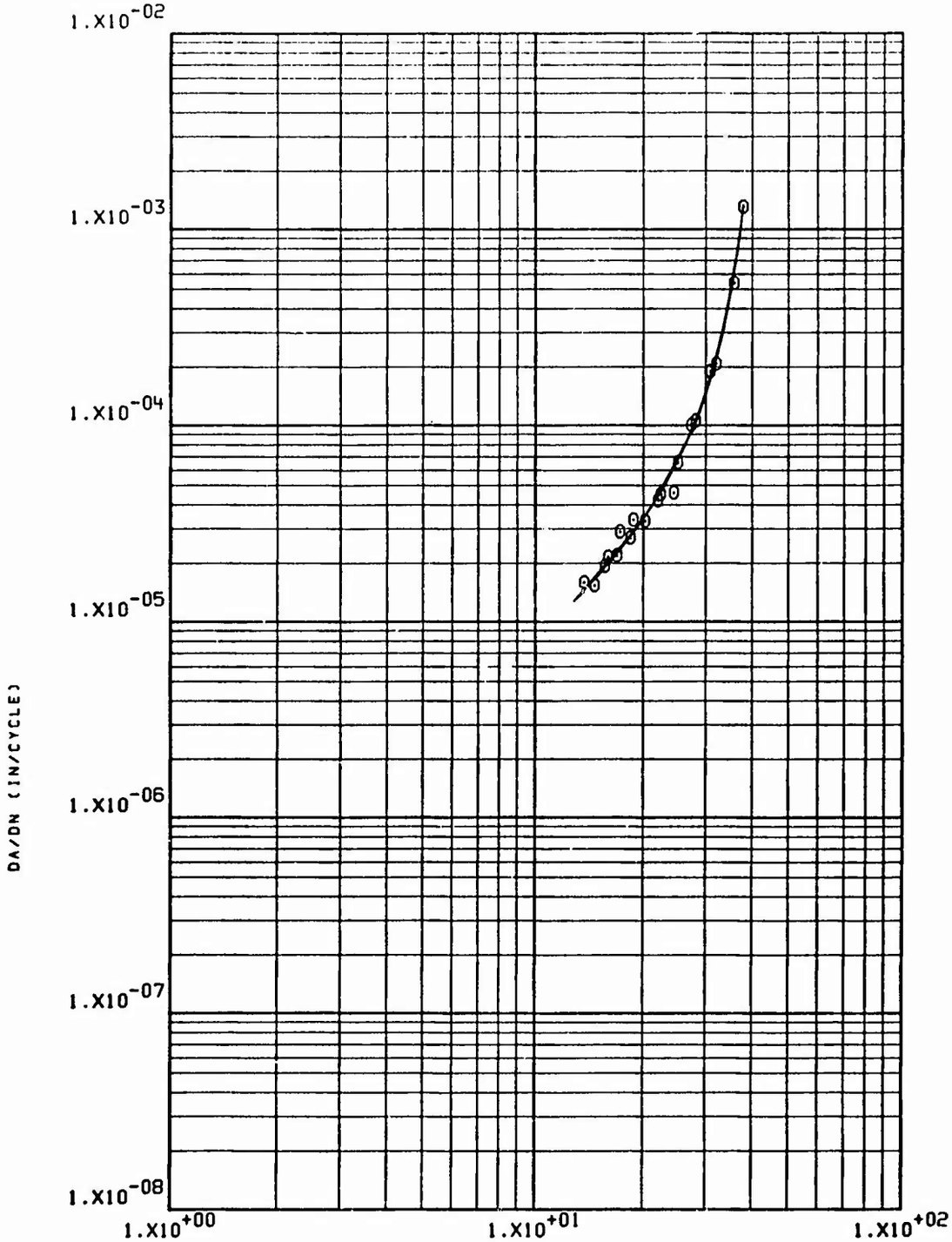

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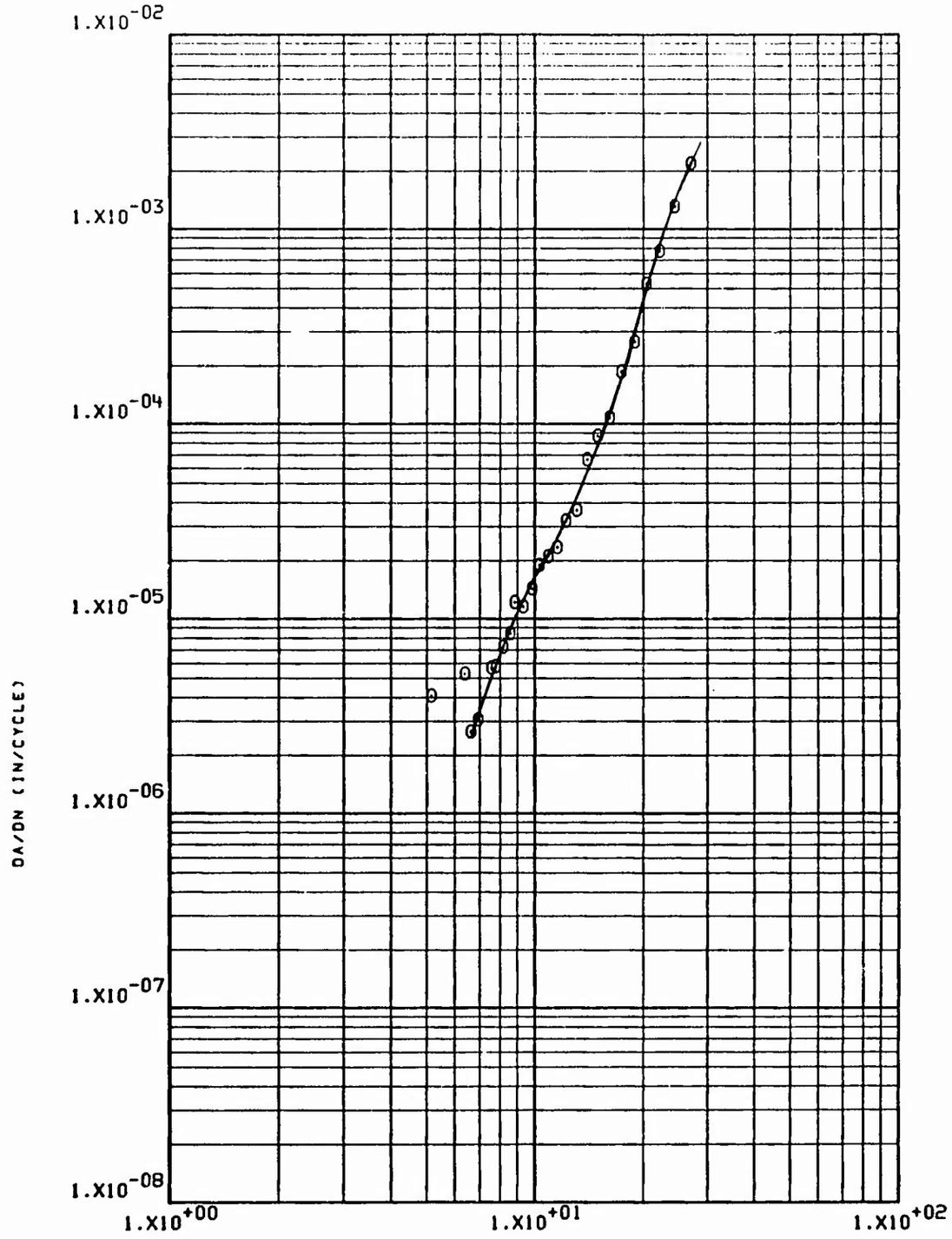
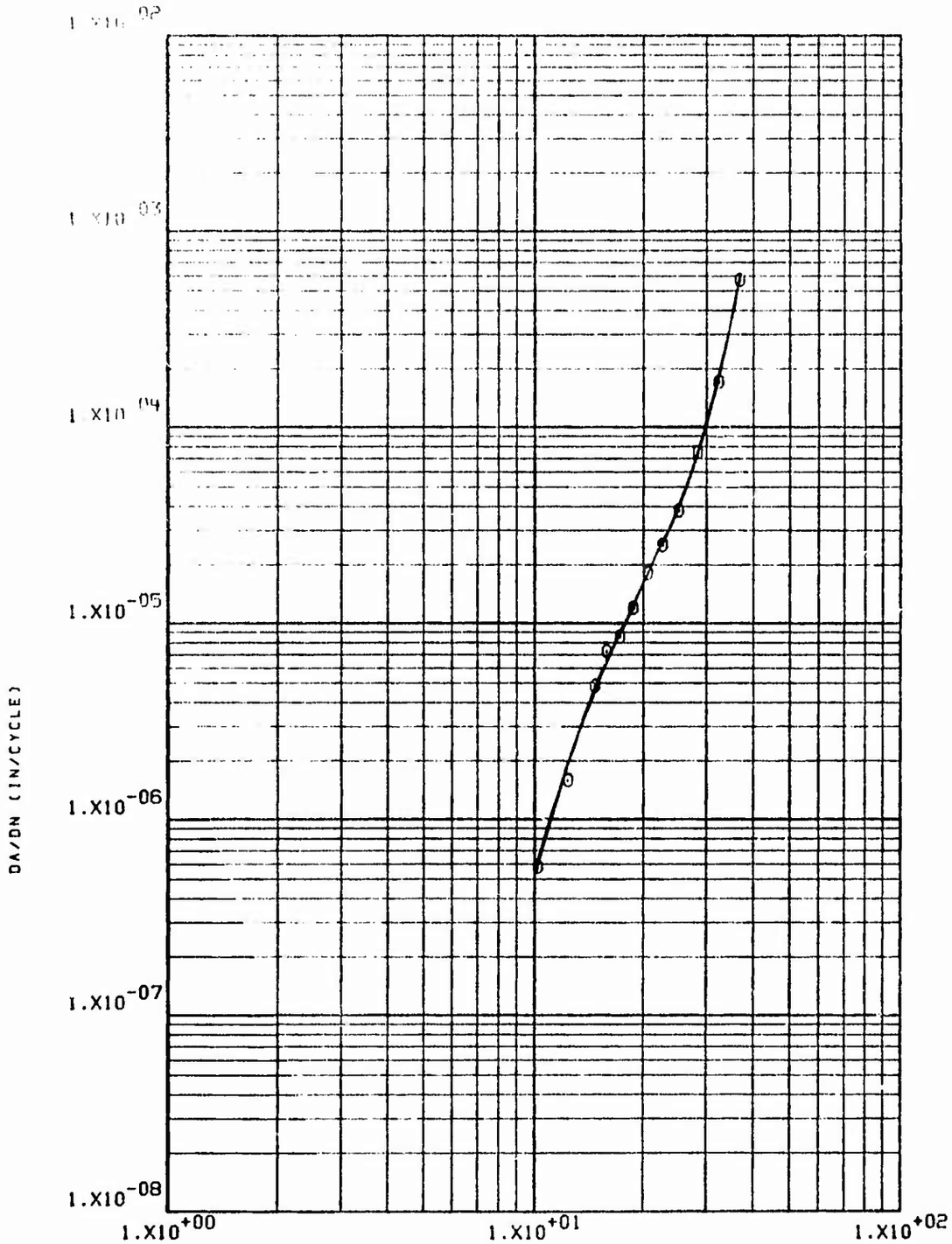


62 NRW 4-1 TI-6AL-4V DB LHA RT R=0.3 60CPM



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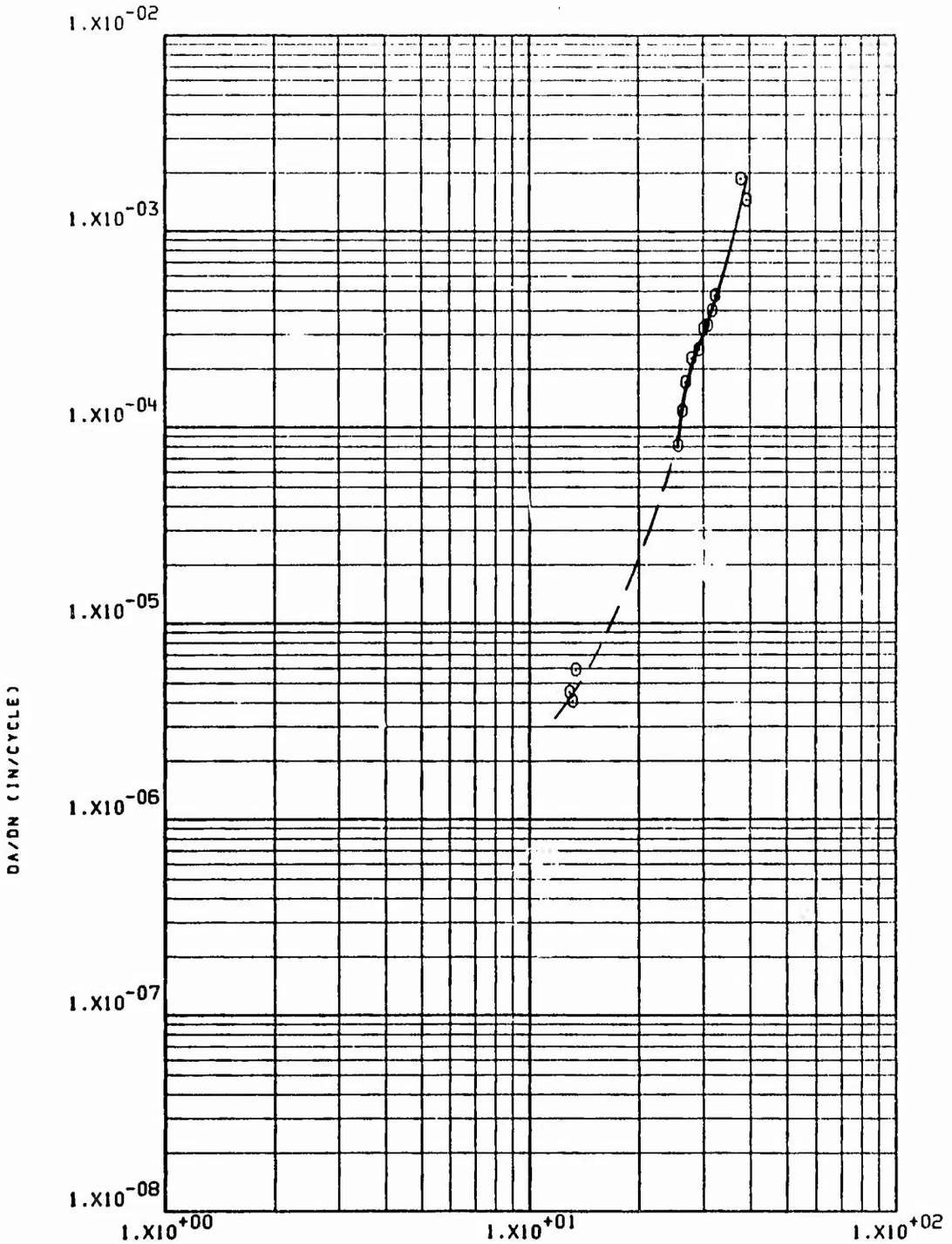

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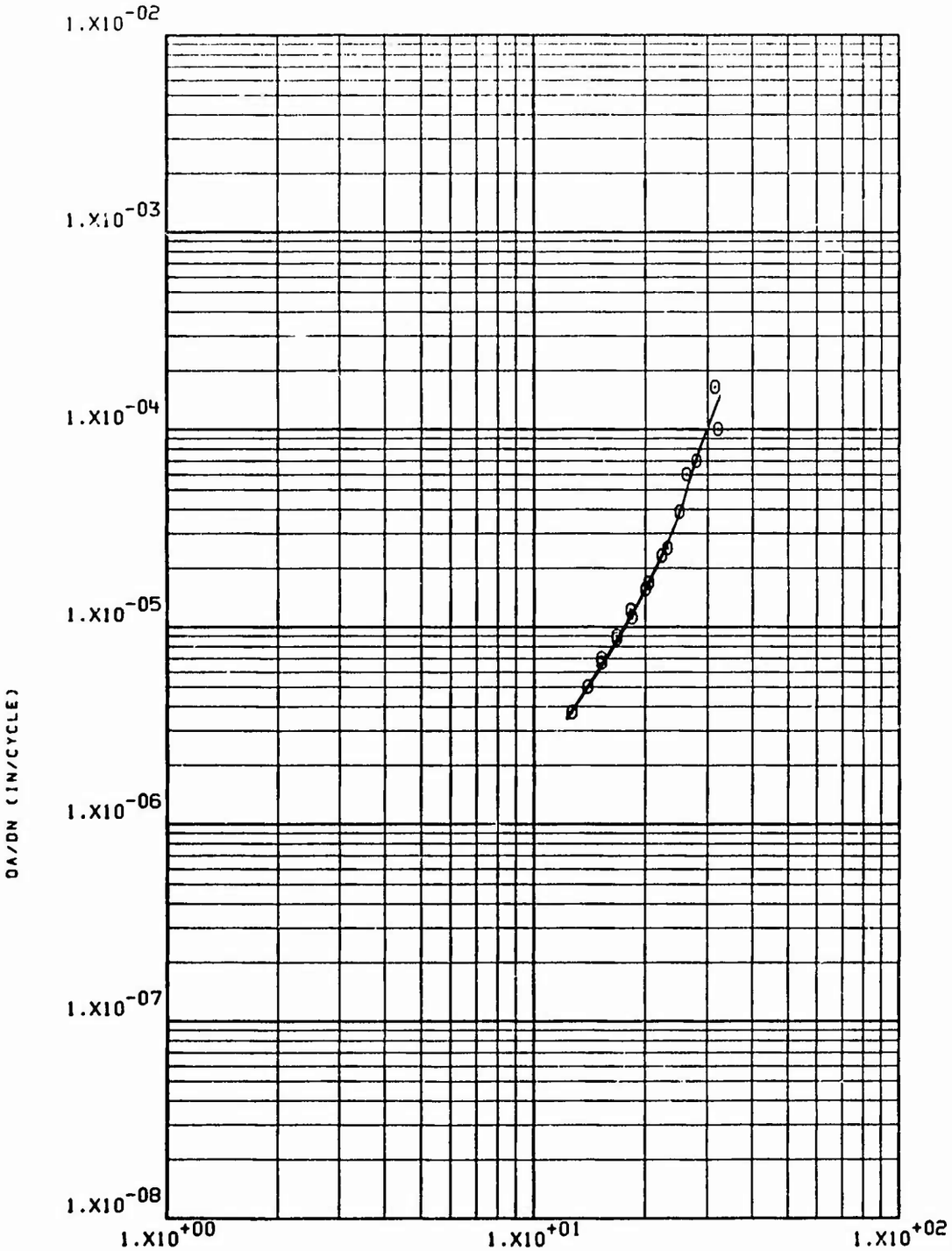

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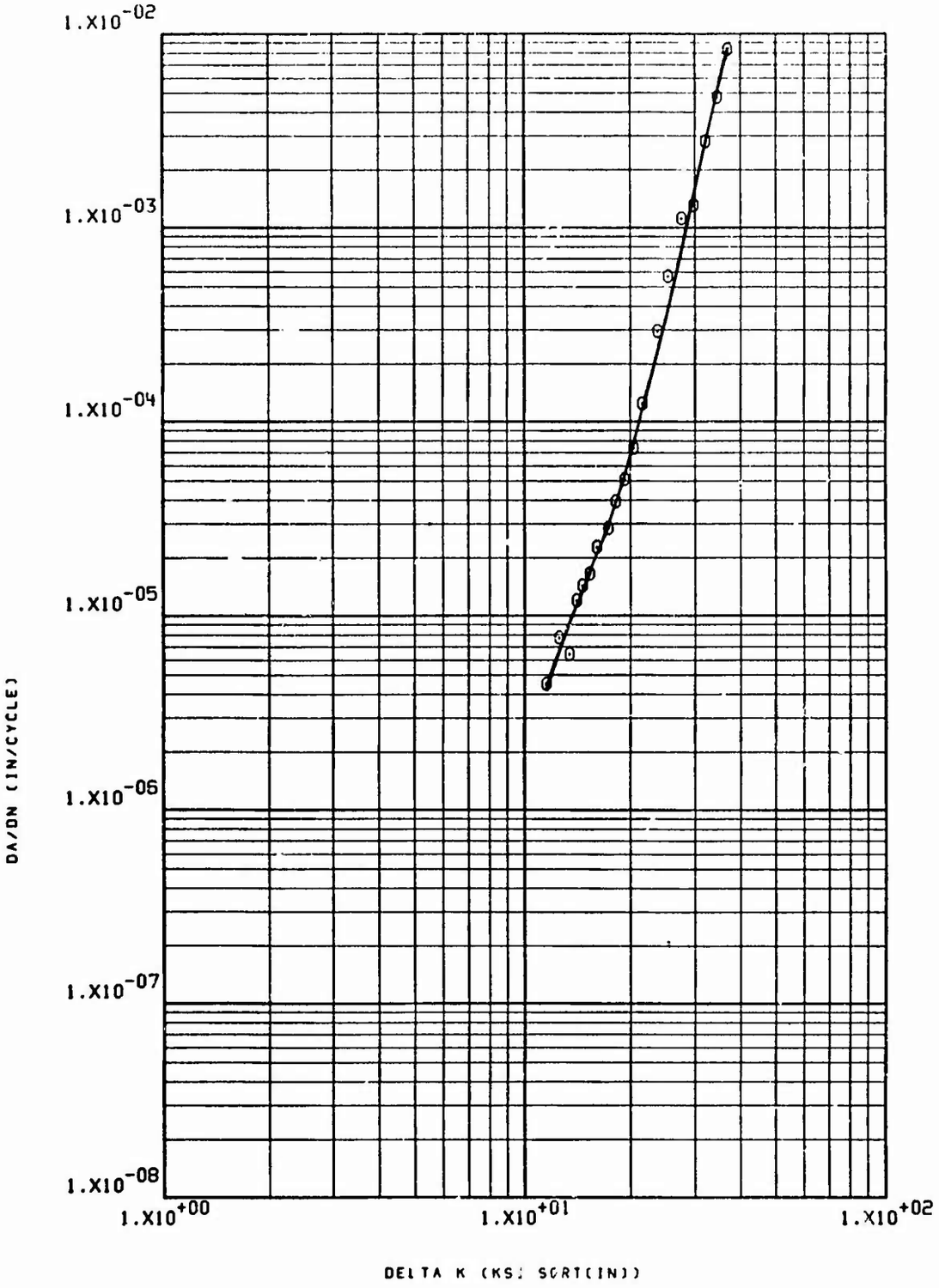

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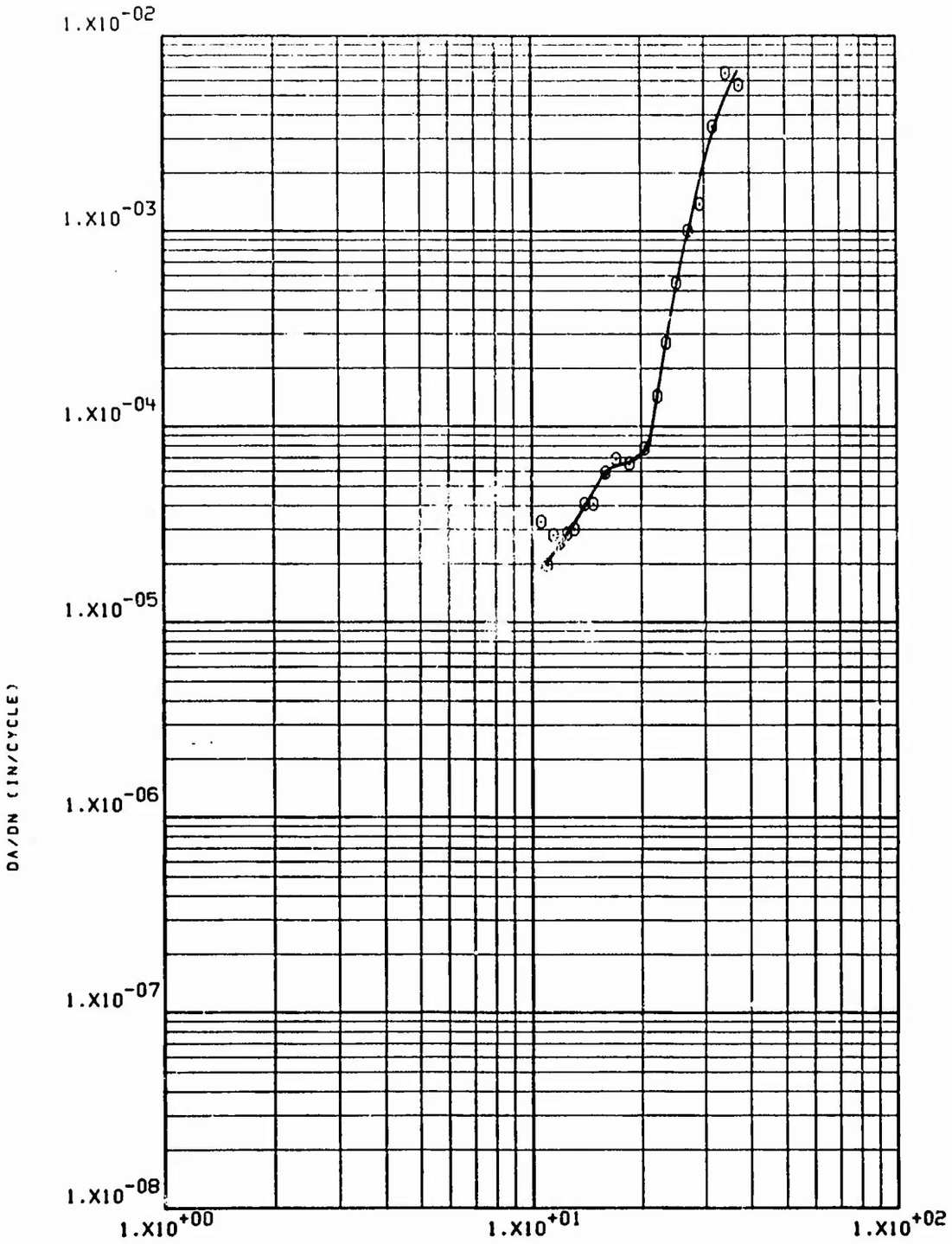

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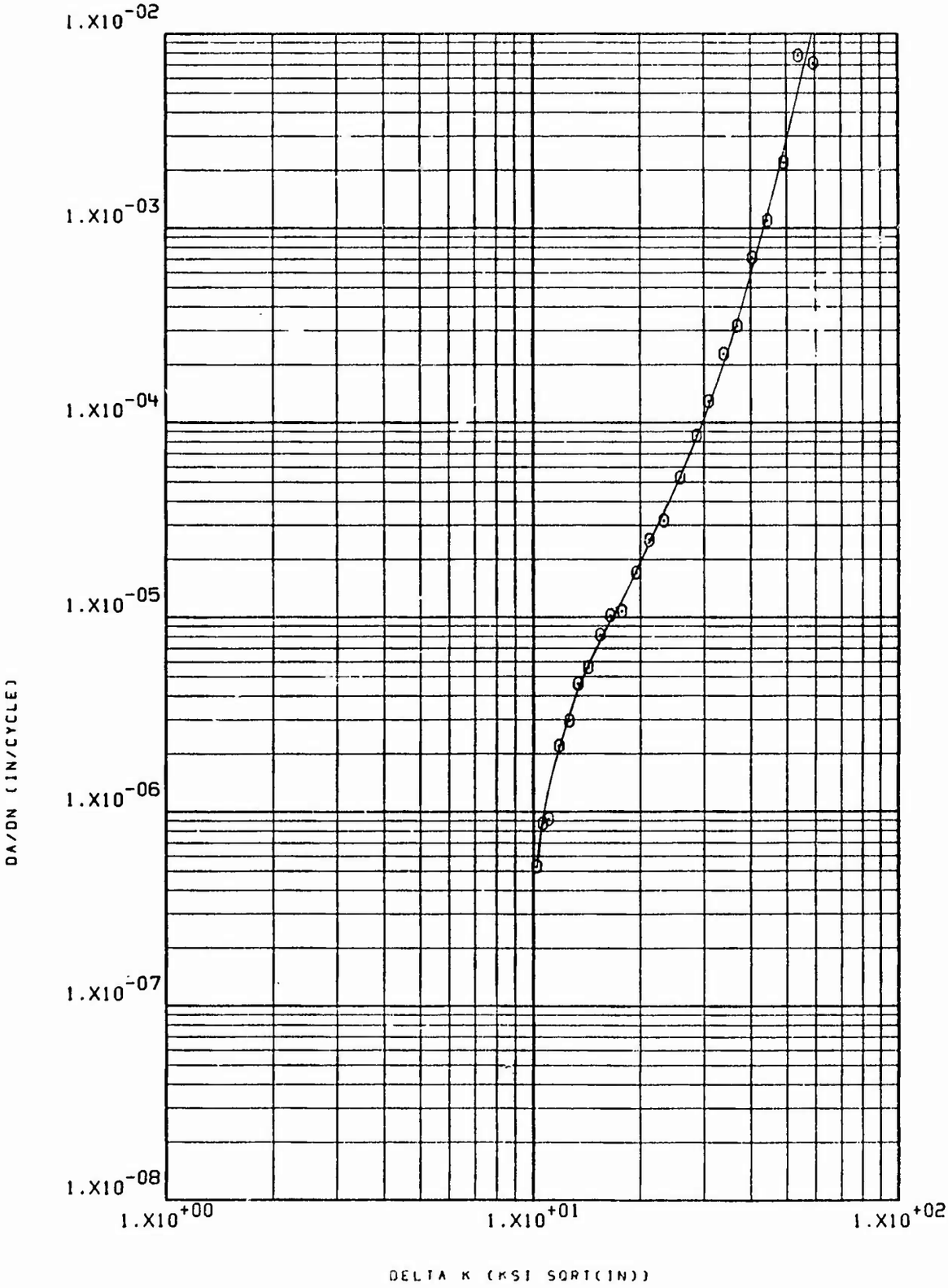

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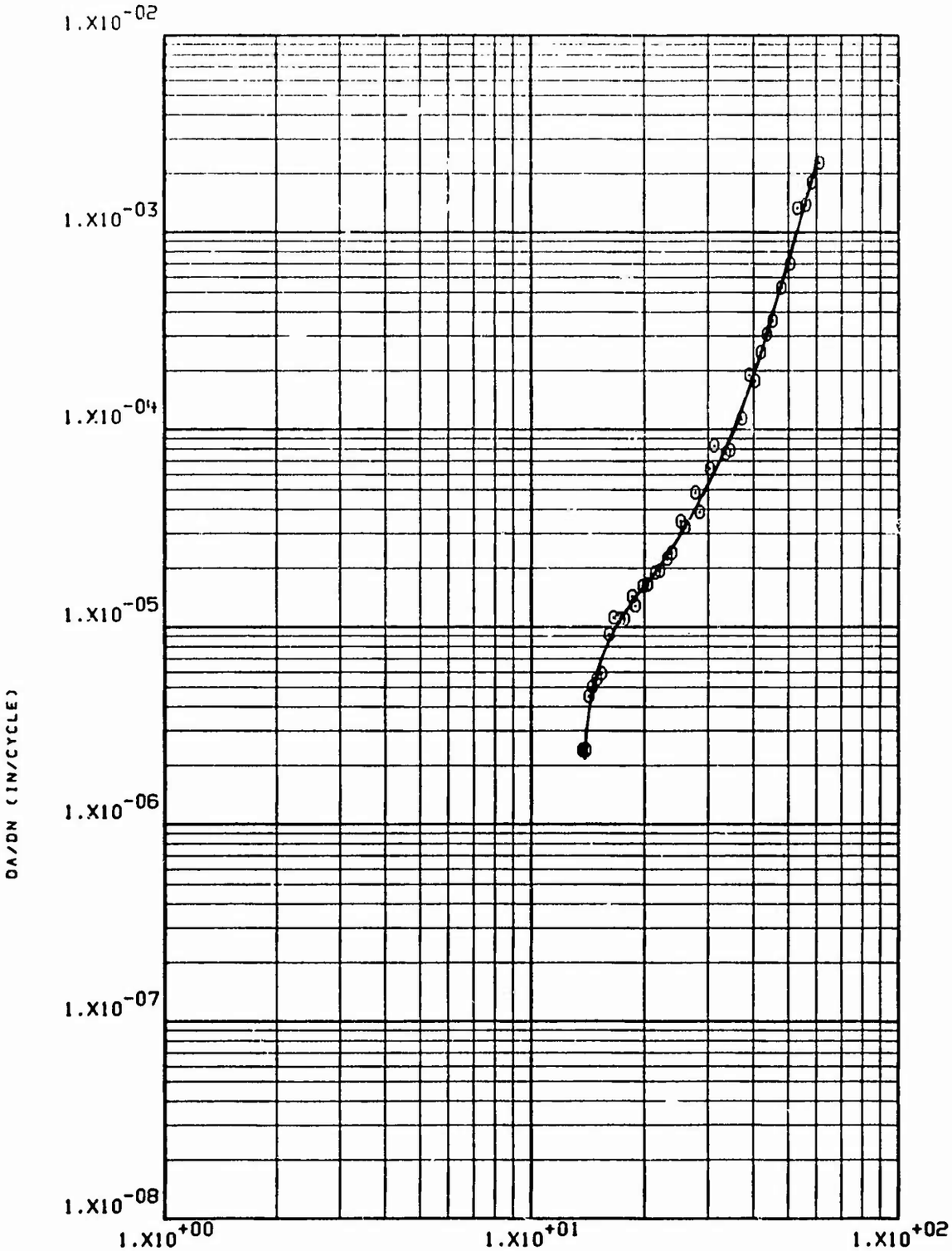

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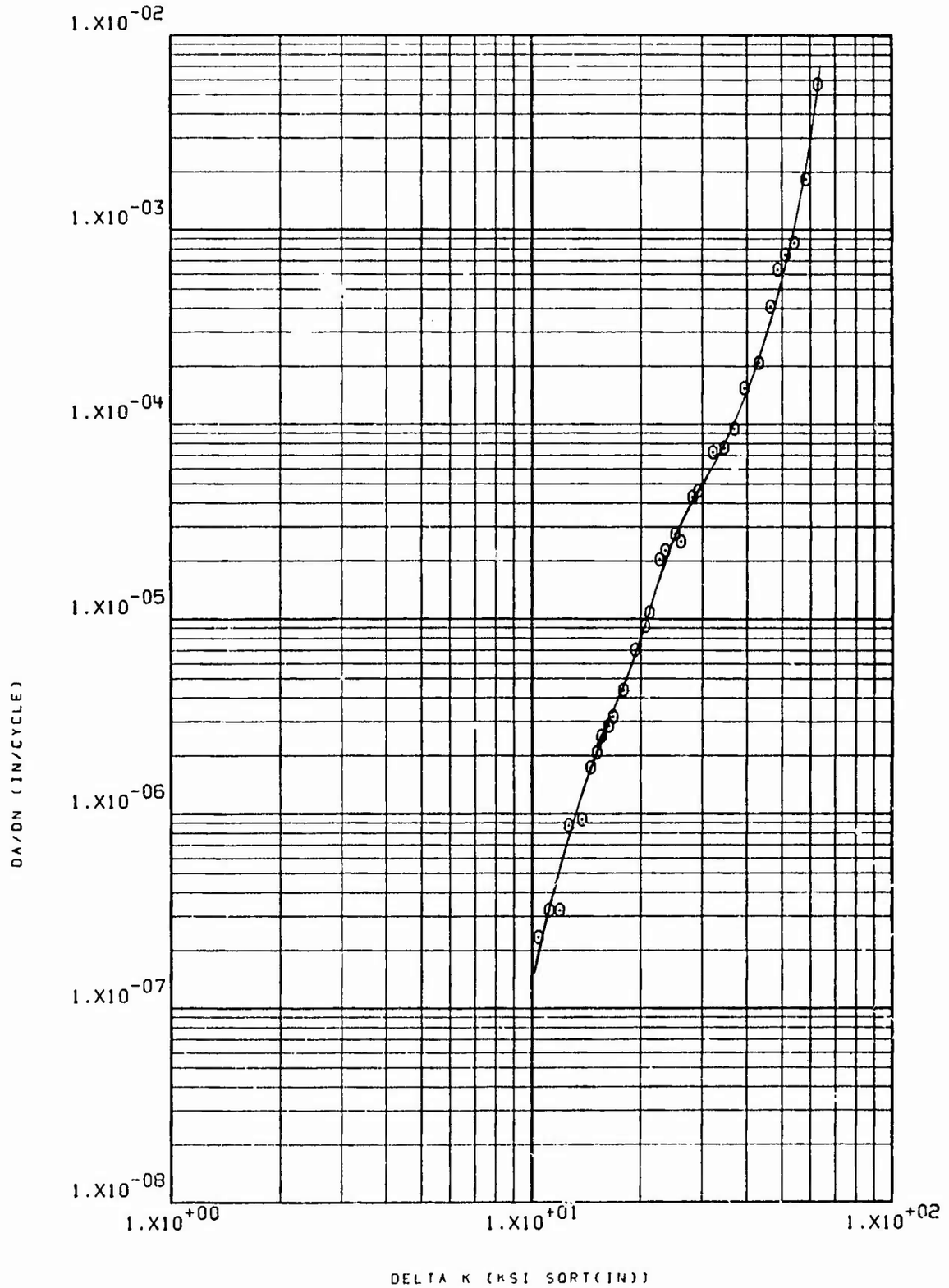
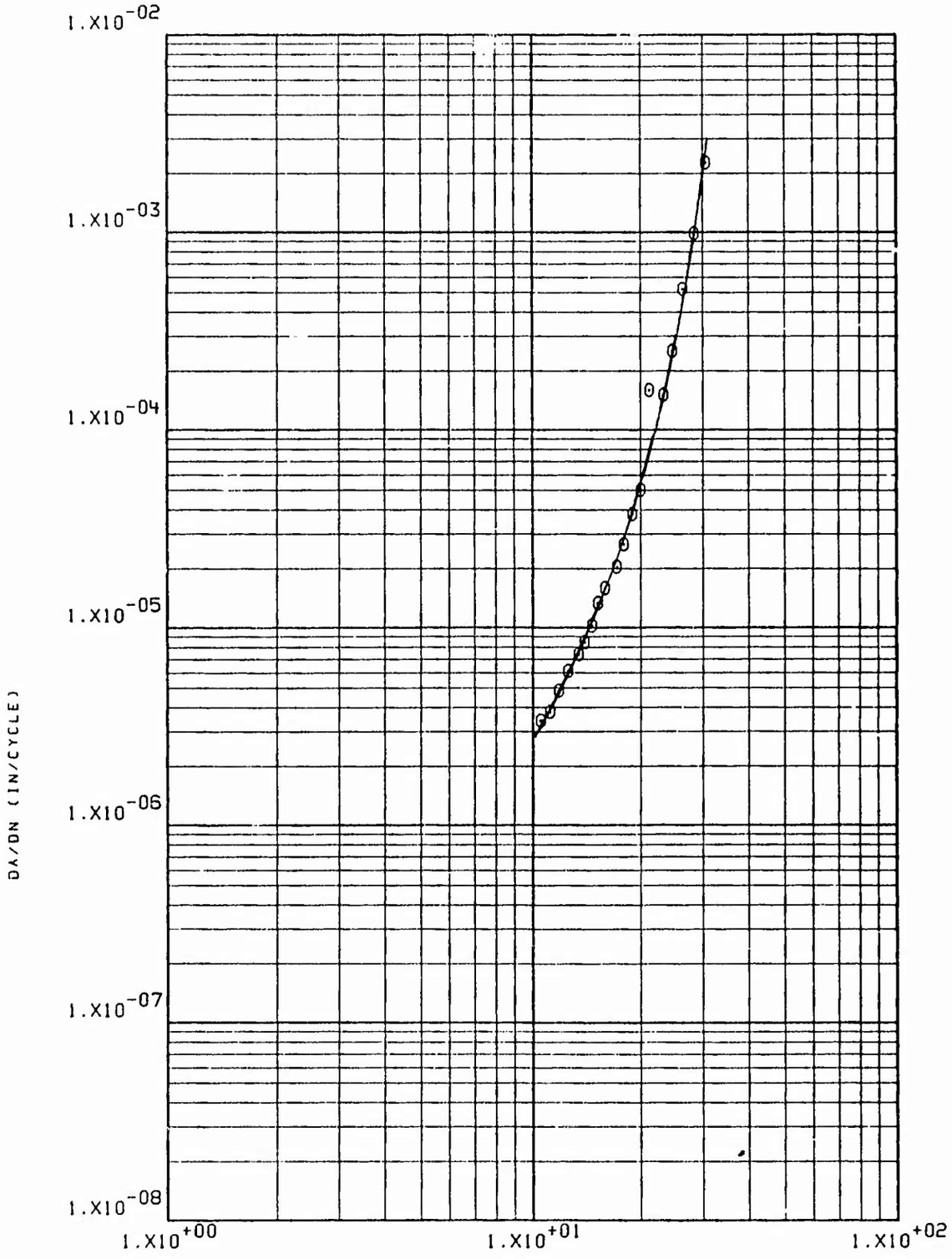


82 NPW 4 201 TI 6AL 4V BETA ANN LHA RT 60CPM R=.3



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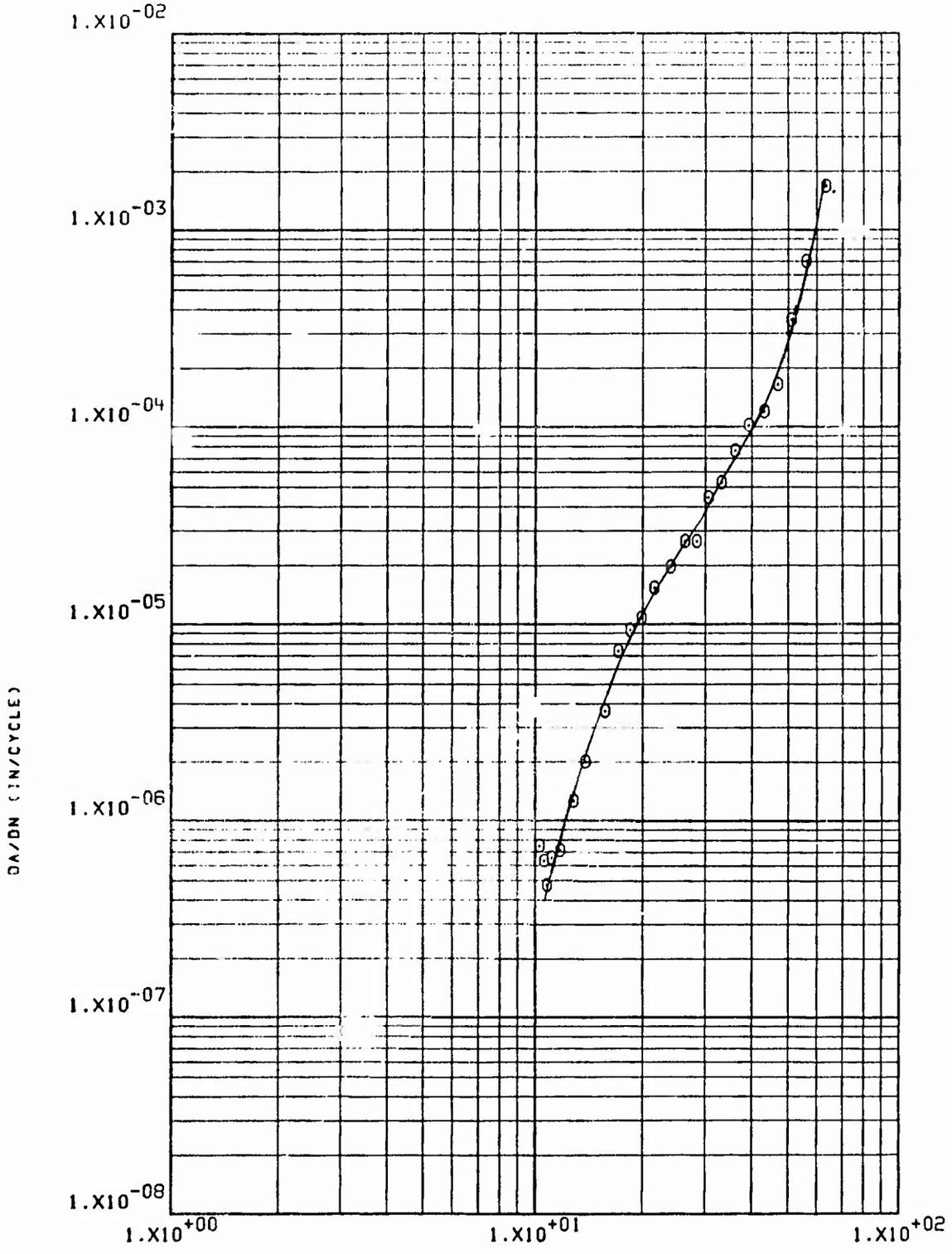

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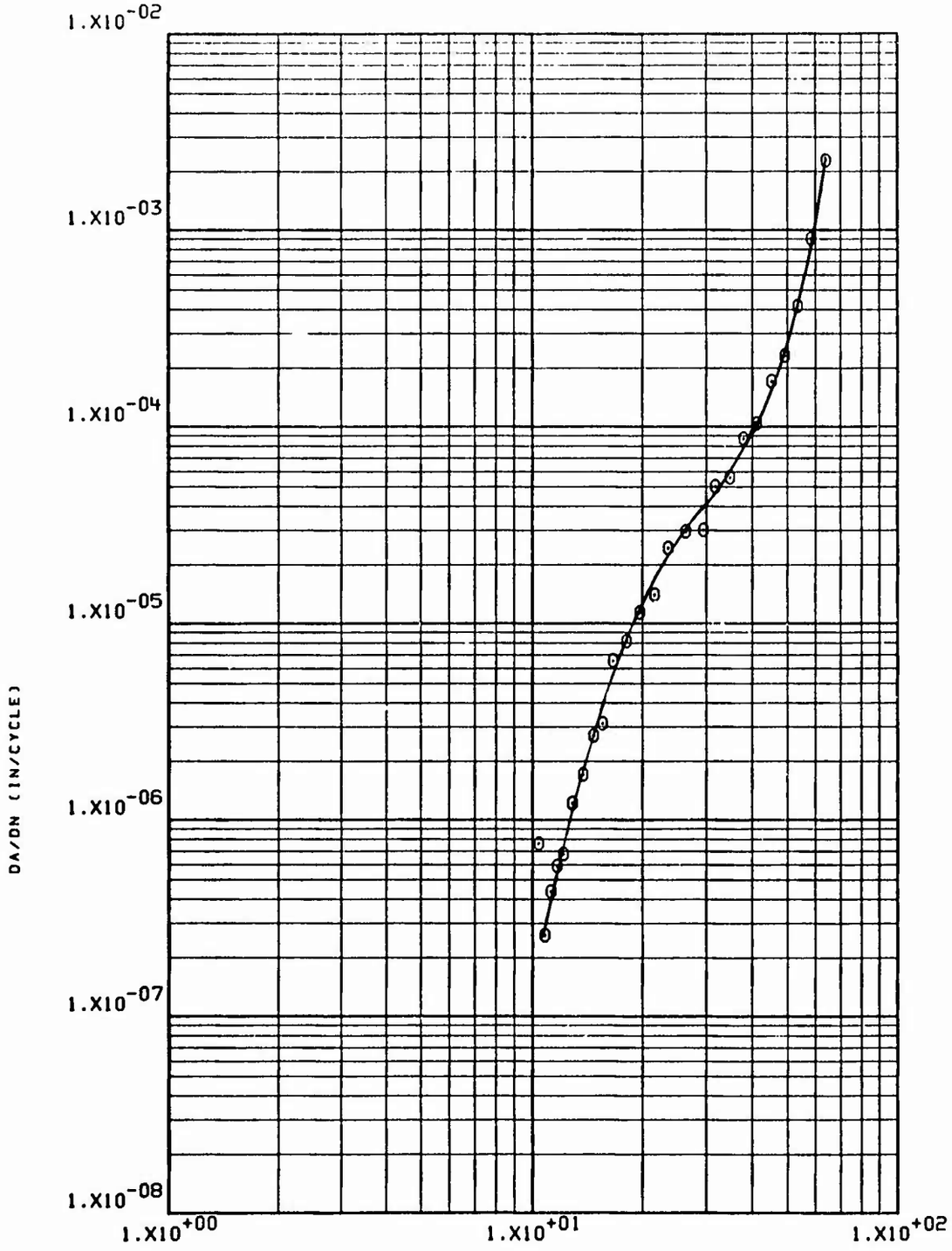

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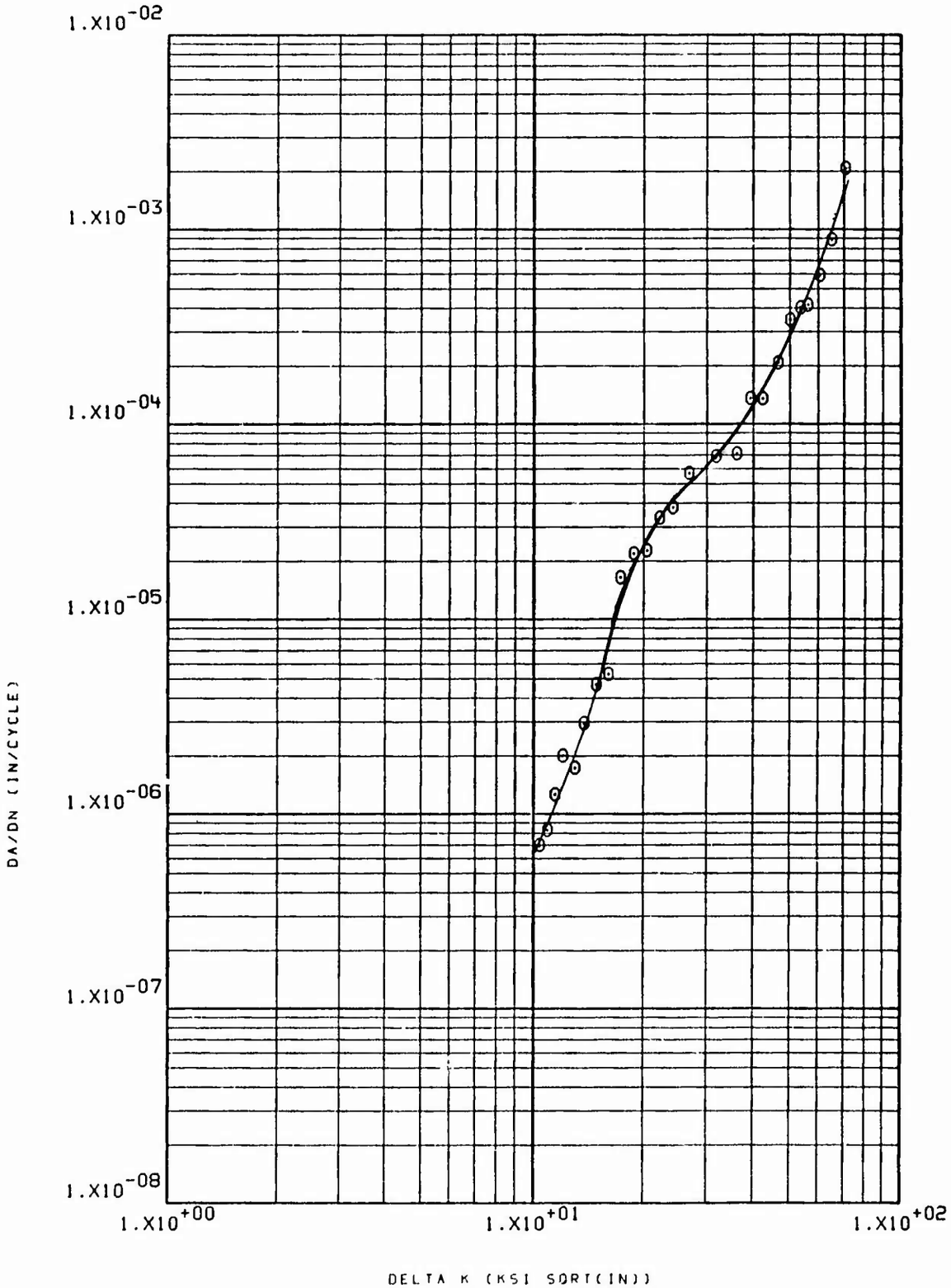

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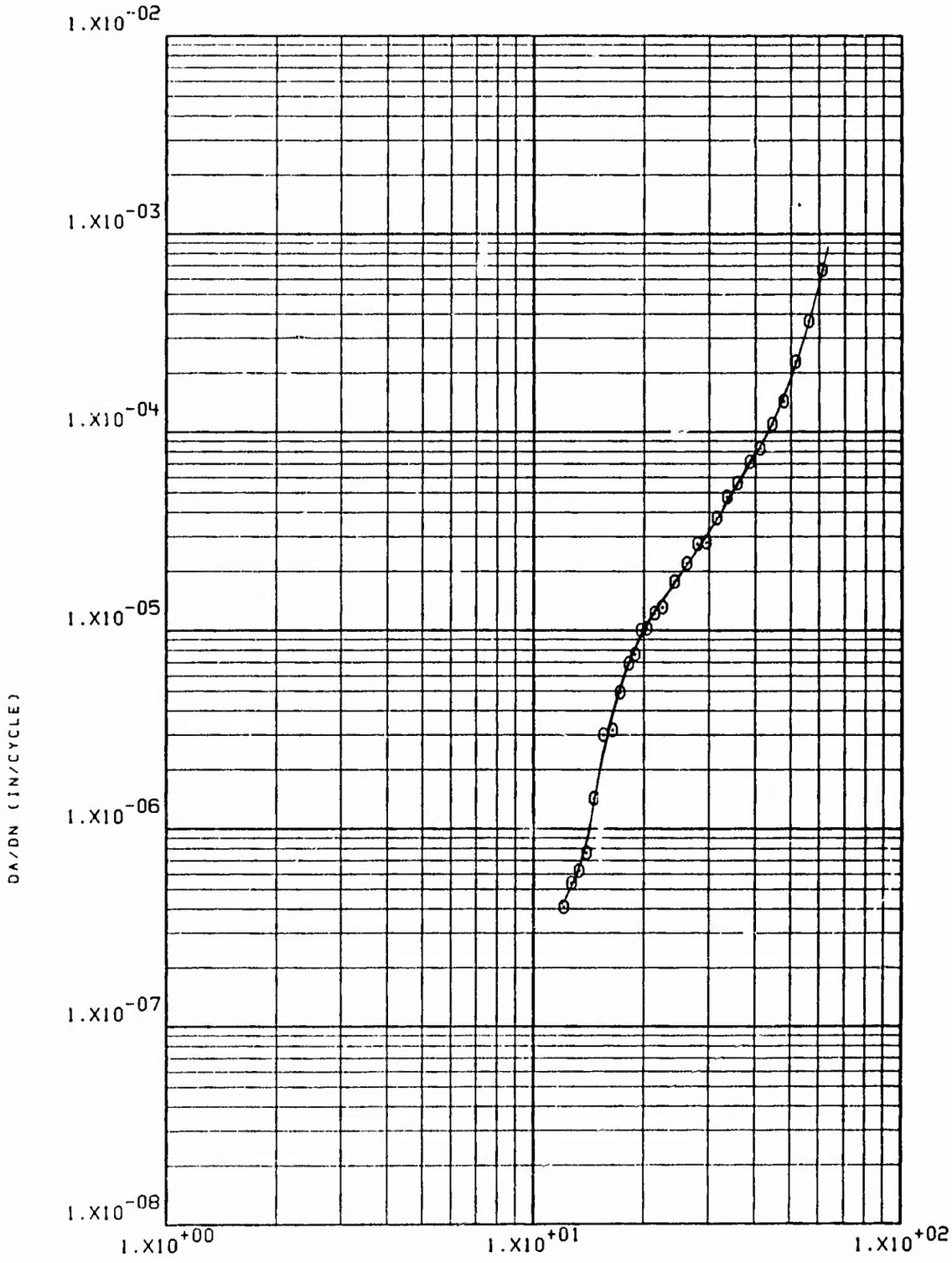
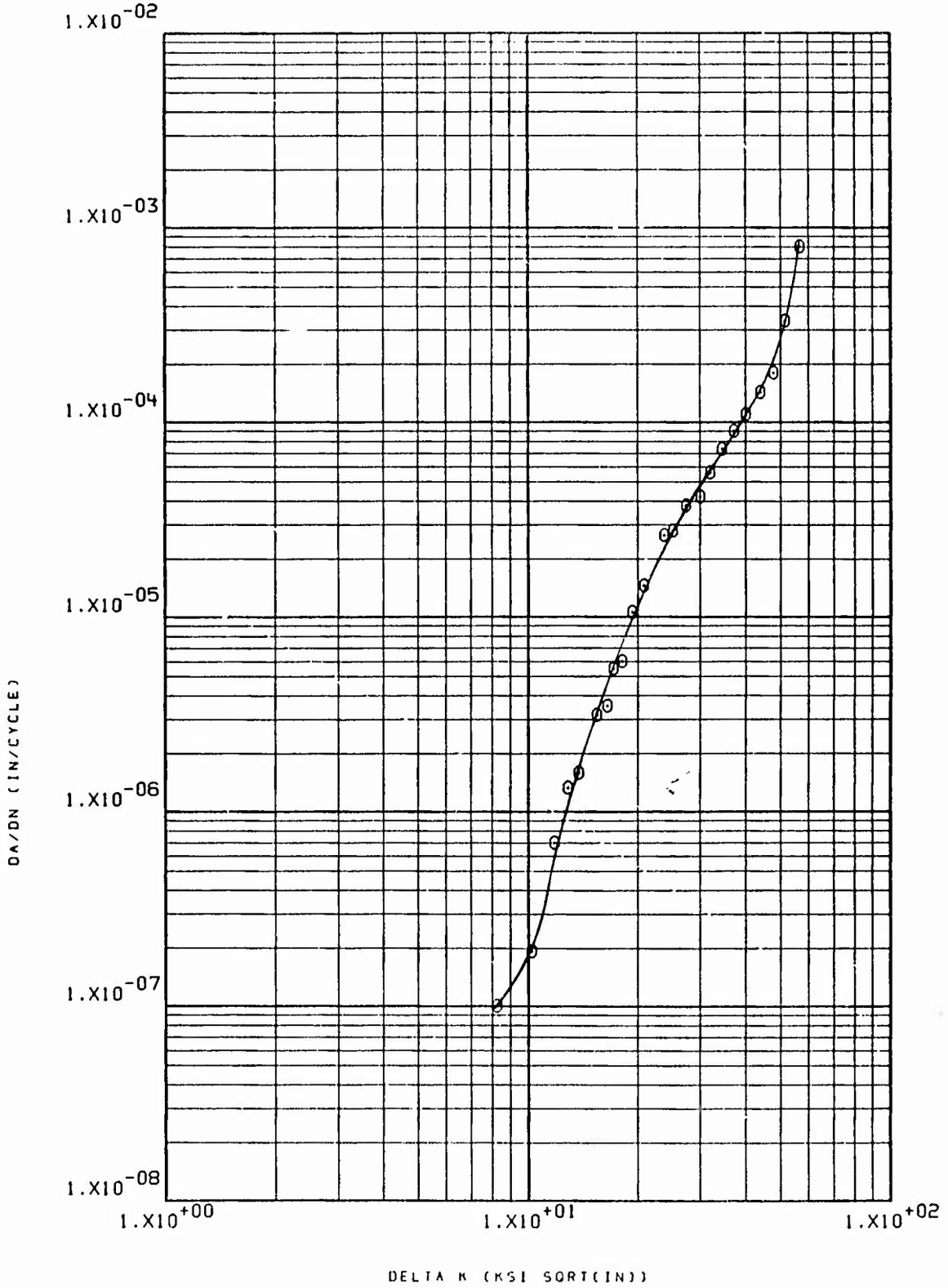


64 NP# 11-7 TI CAL 4V MA LHA RT 3600PM R=.08



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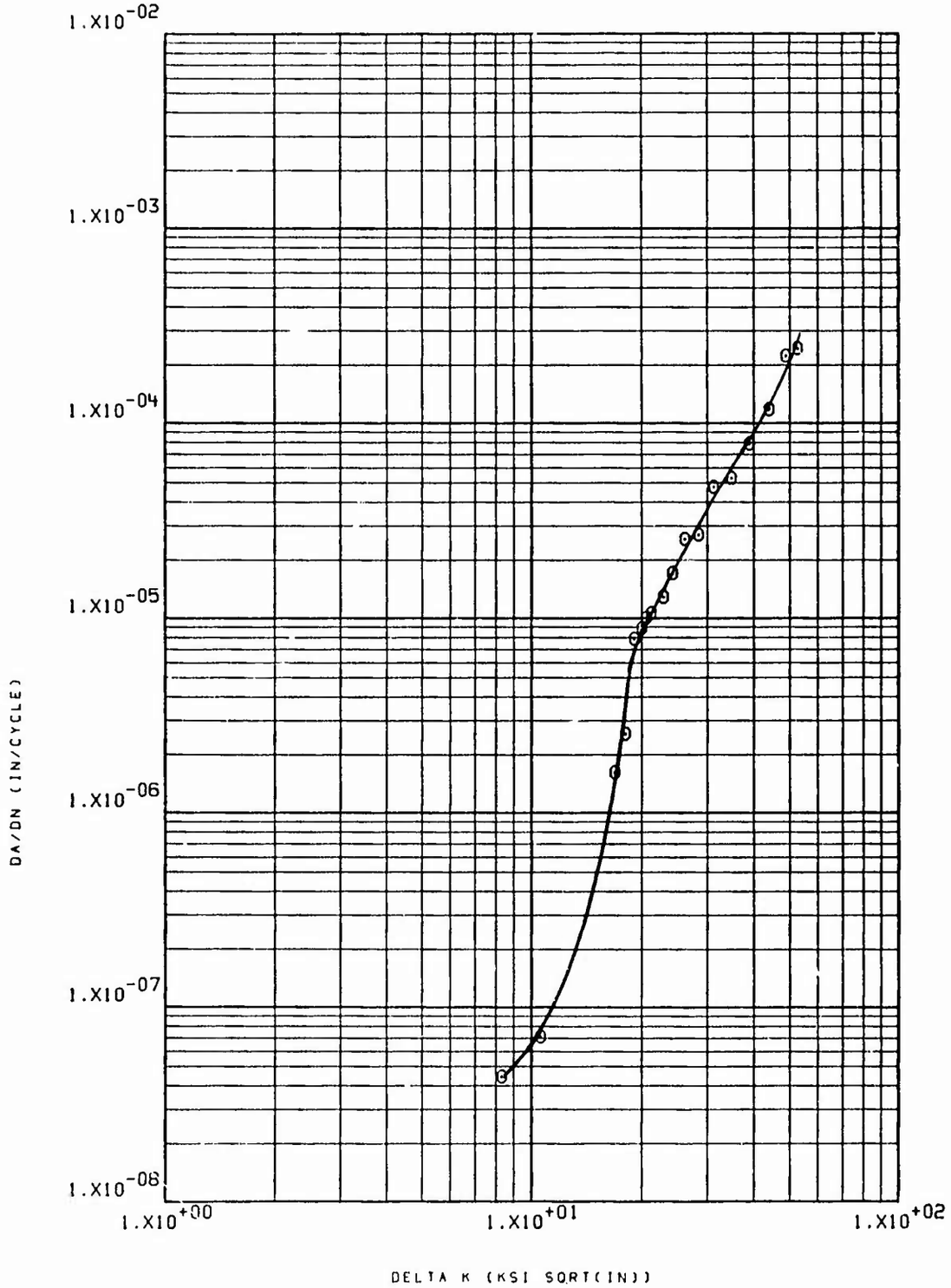

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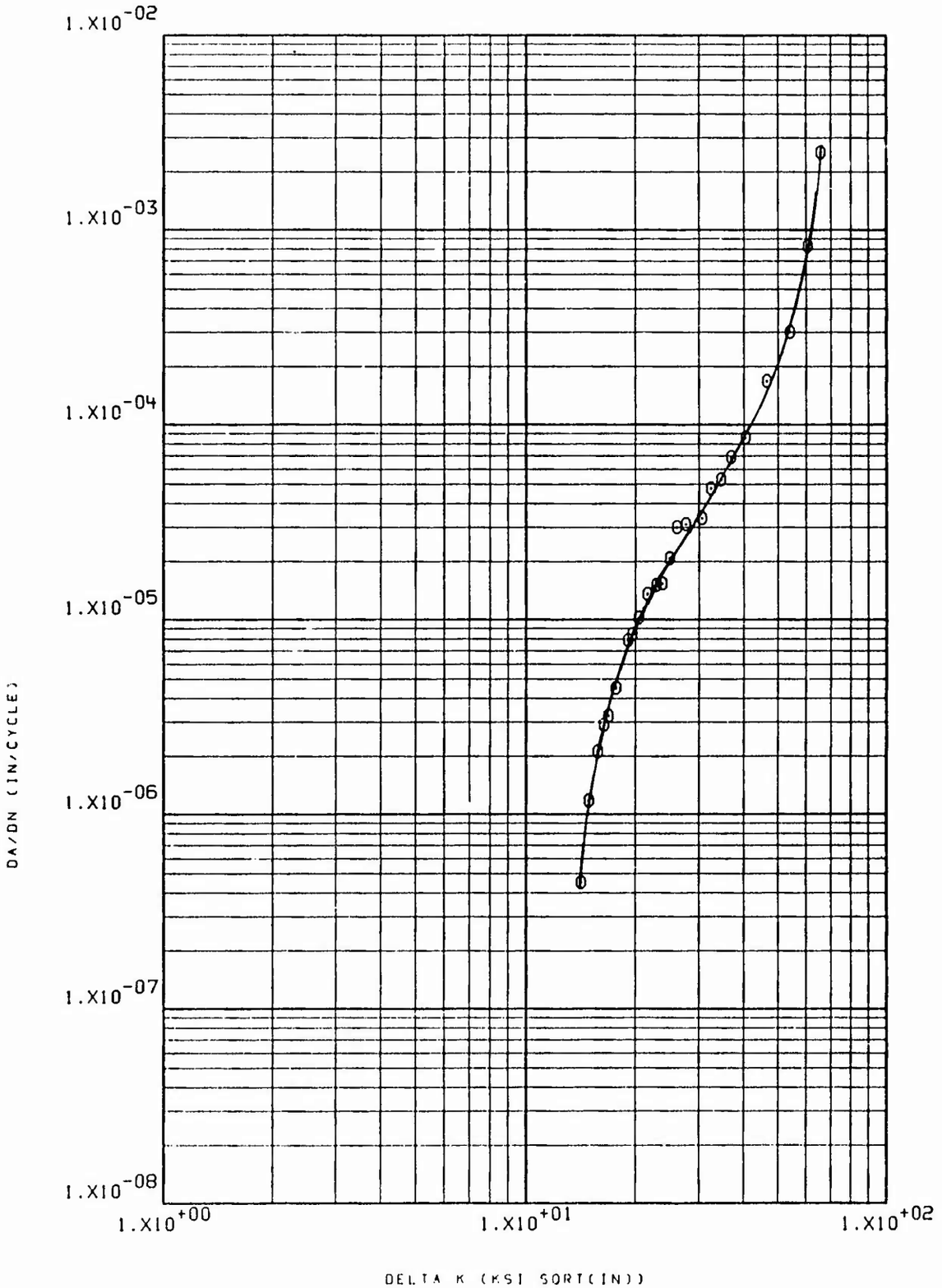
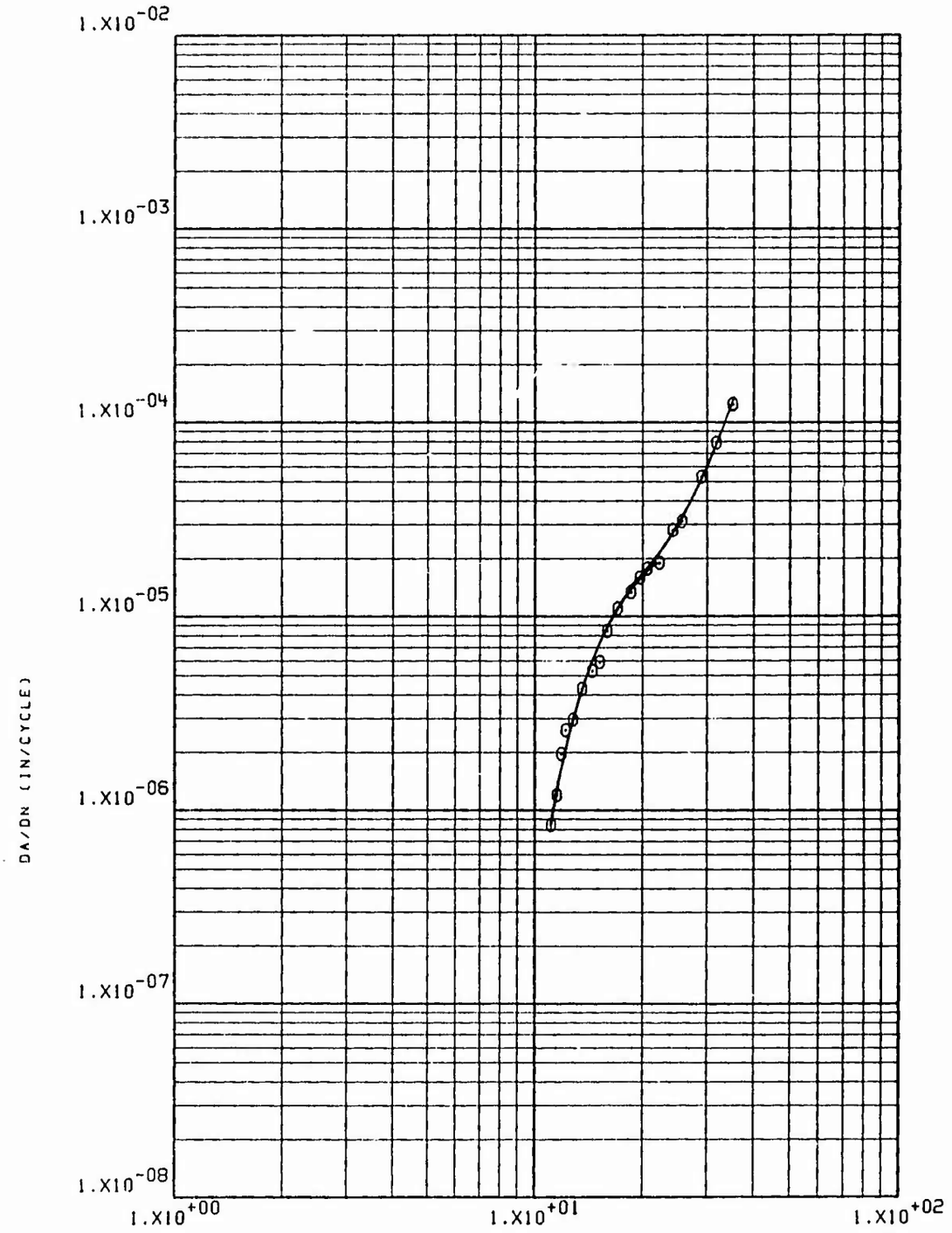


64 NPW 11 10 11 6AL 4V MA LHA R.T. 60CPM R=.08



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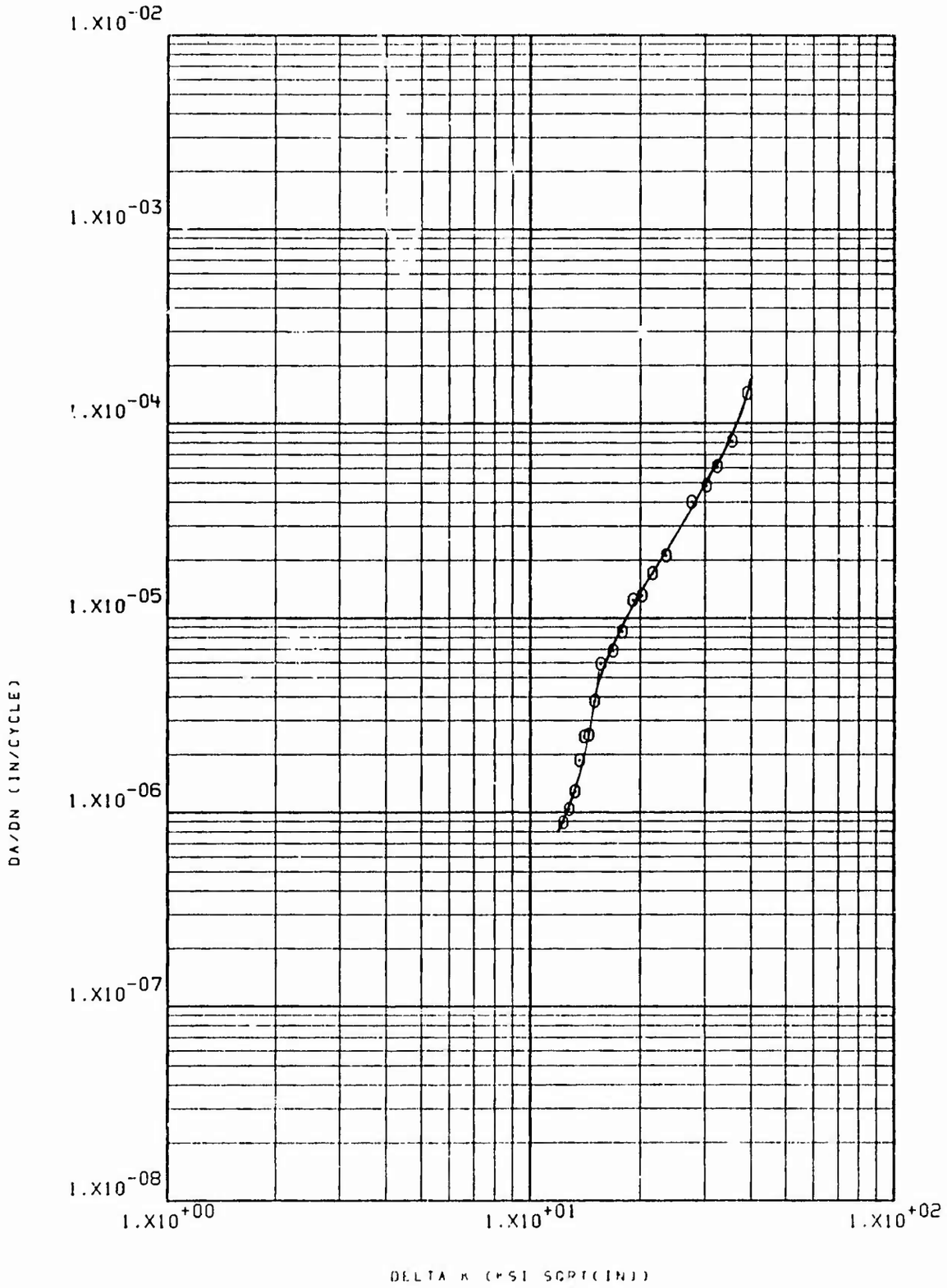
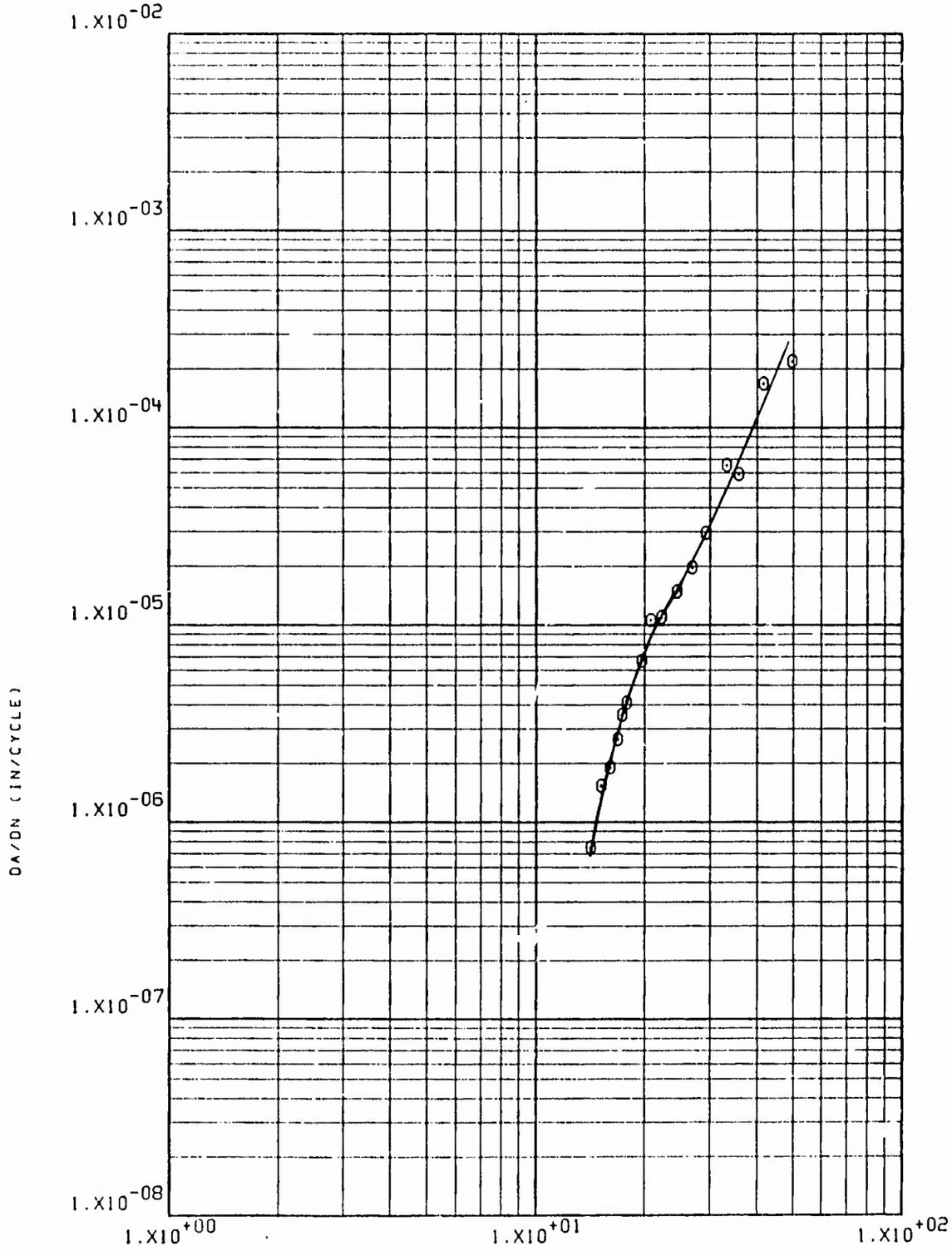
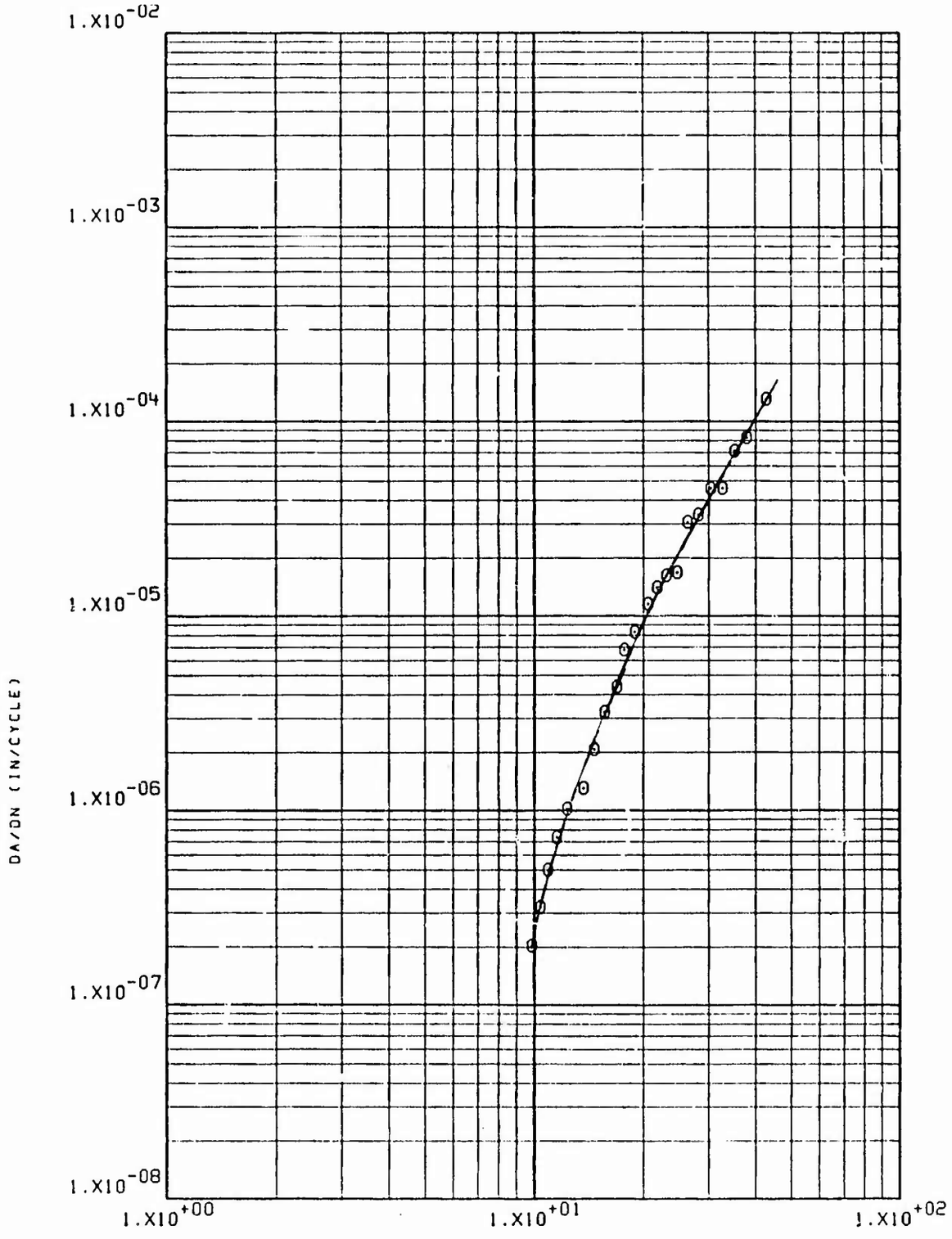
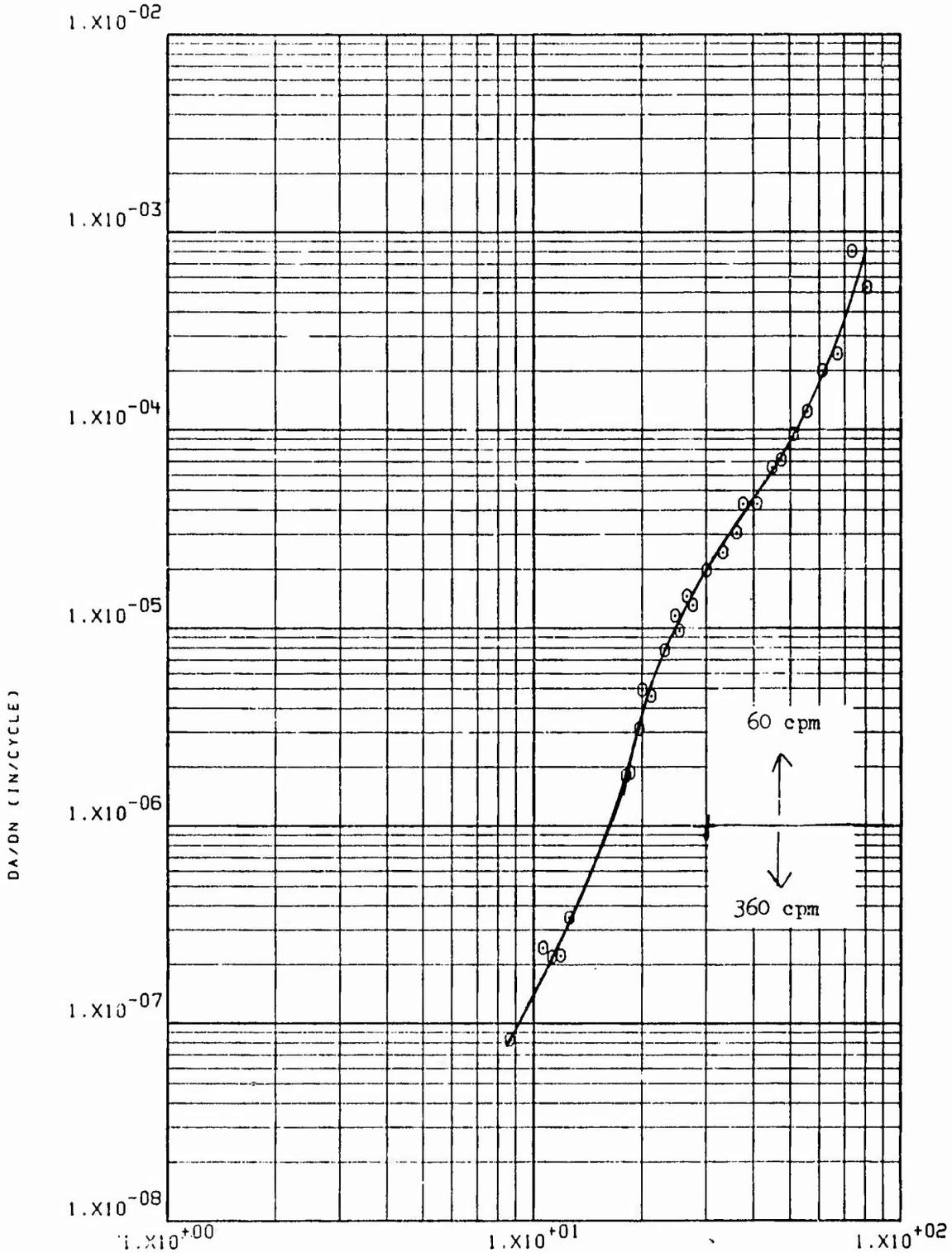

1.X10-02
1.X10-03
1.X10-04
1.X10-05
1.X10-06
1.X10-07
1.X10-08
DA/DN (IN/CYCLE)
1.X10+00
1.X10+01
1.X10+02
DELTA K (PSI SQRT(IN))

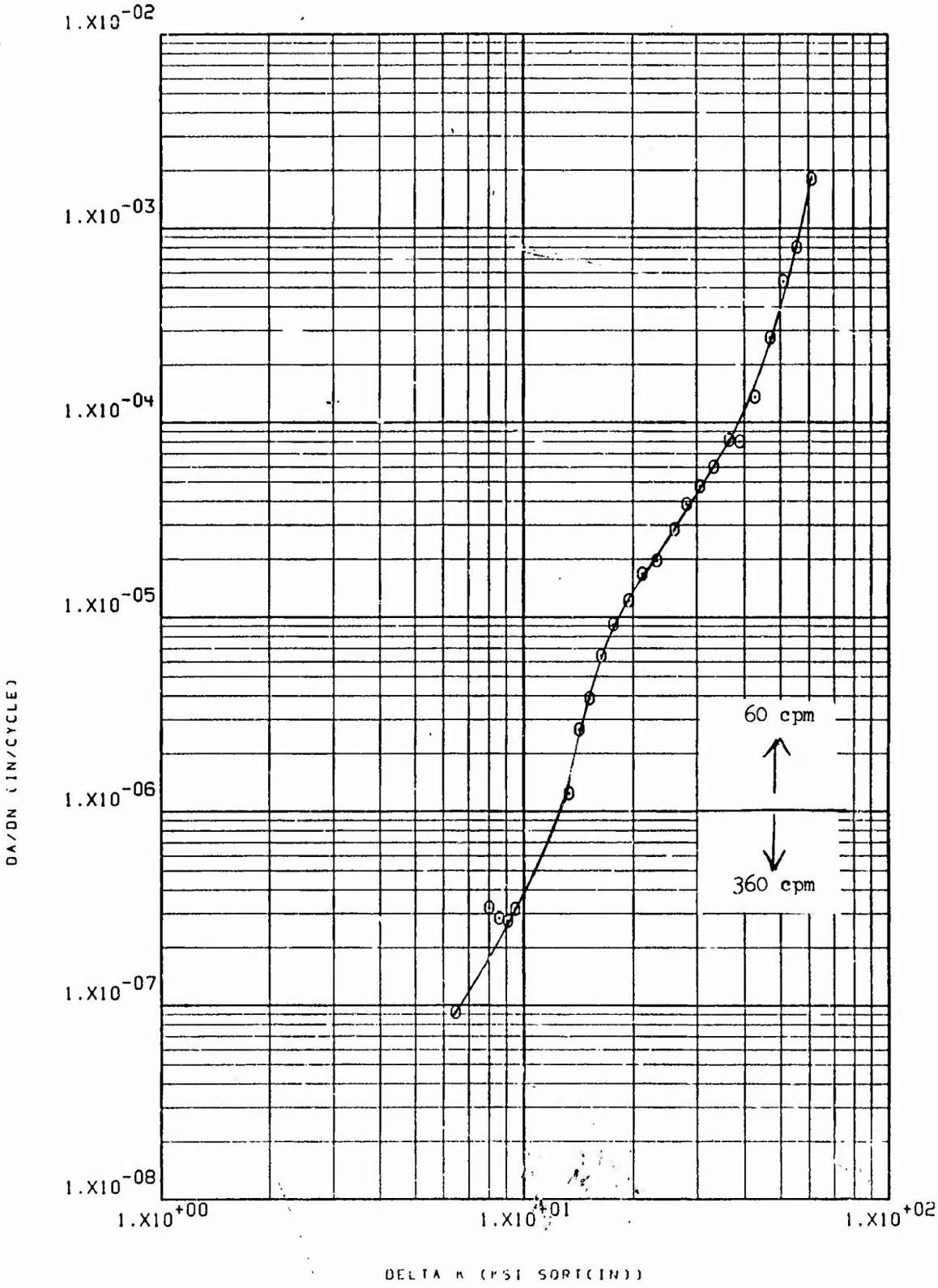


0.4 GAP II 13 TI 6AL 4V MA LHA R.T. 300CPM R .08


1.X10-02
1.X10-03
1.X10-04
1.X10-05
1.X10-06
1.X10-07
1.X10-08
DA/DN (IN/CYCLE)
1.X10+00
1.X10+01
1.X10+02
DELTA K (PSI SQRT(IN))



6.6 MaP 16 1 TI 6AL-4V MA L.H.S. R.T. 60 & 360 CPM R=.3



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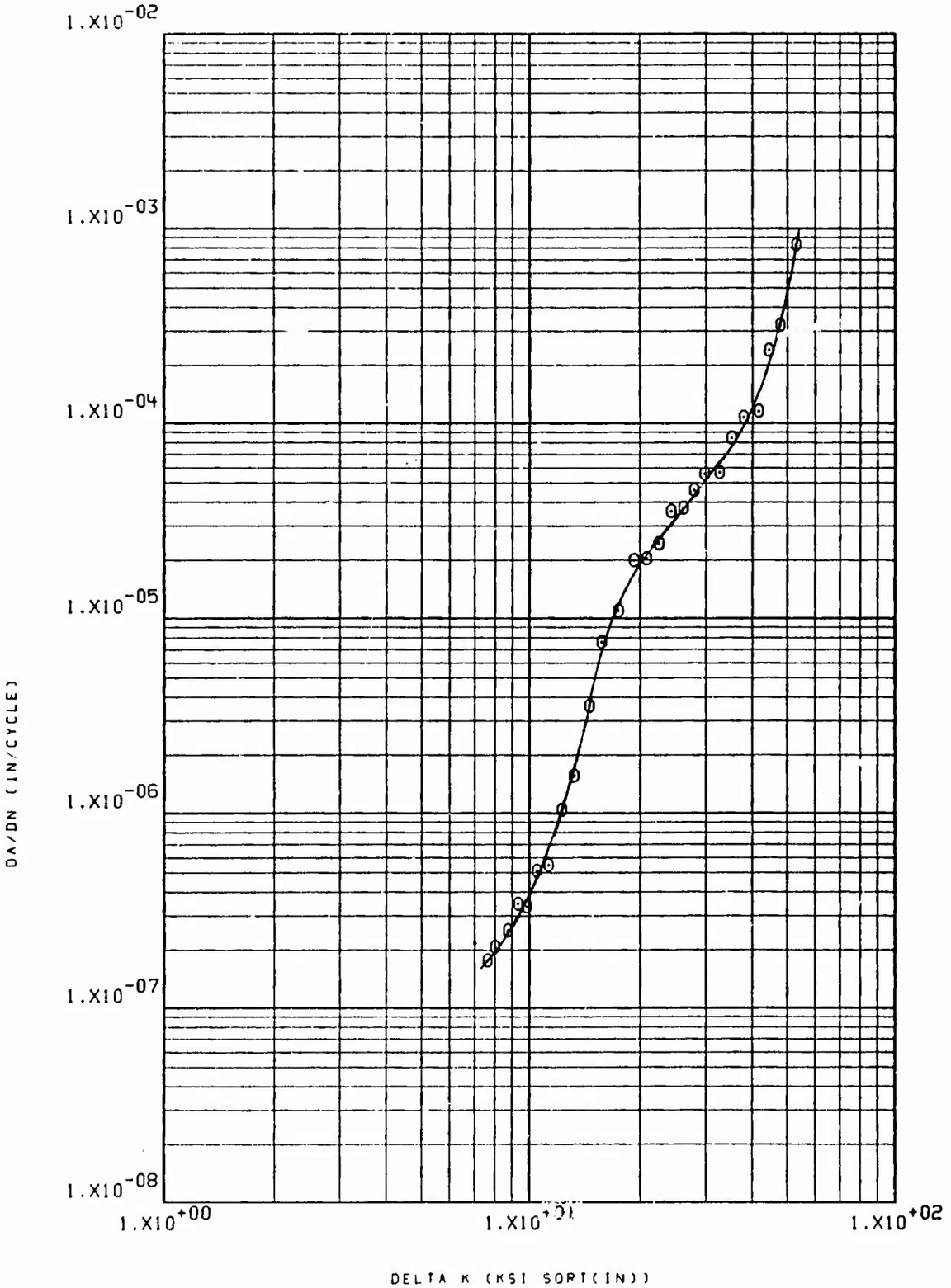
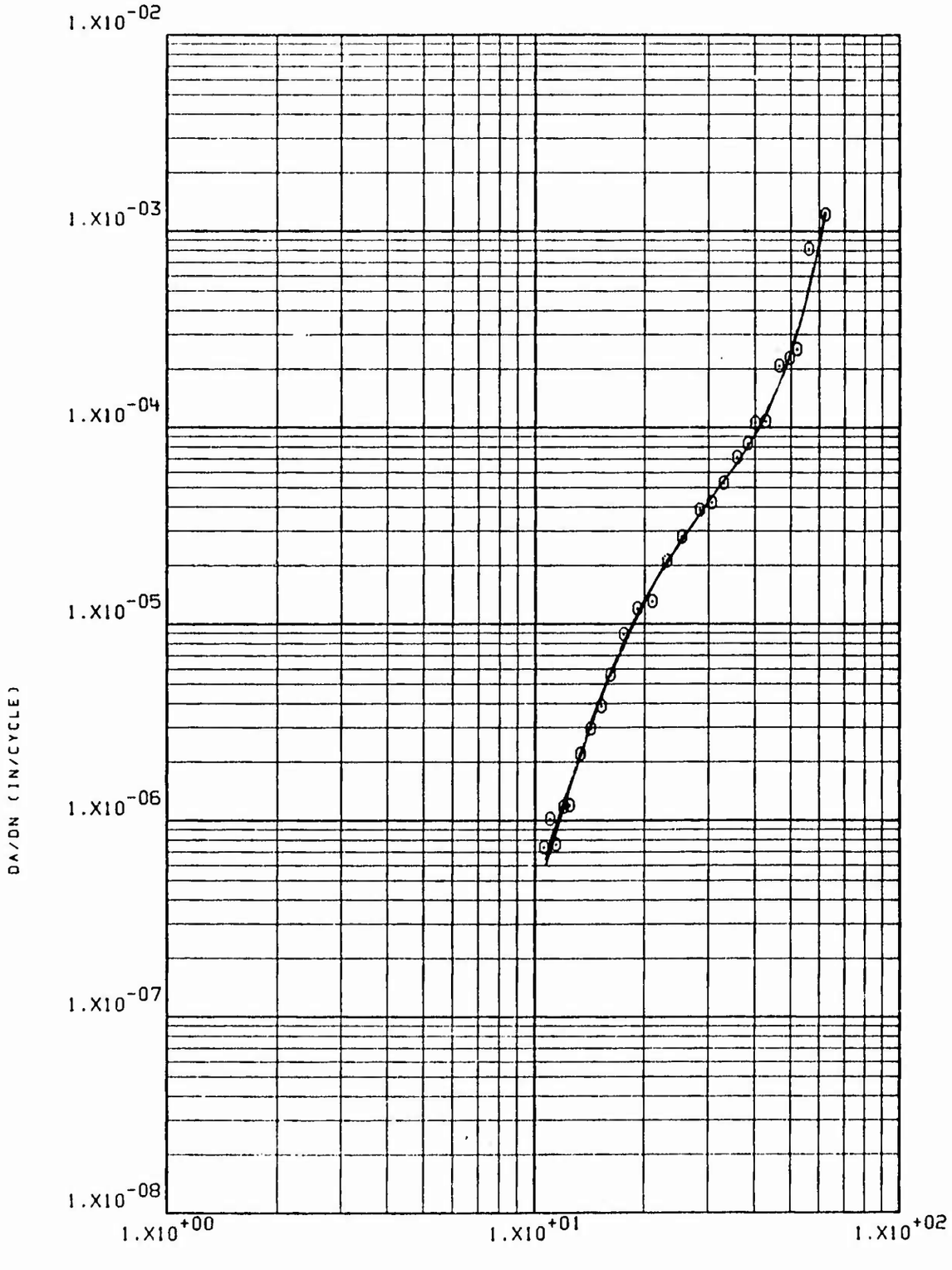

1.X10-02
1.X10-03
1.X10-04
1.X10-05
1.X10-06
1.X10-07
1.X10-08
DA/DN (IN/CYCLE)
1.X10+00
1.X10+01
1.X10+02
DELTA K (KSI SQRT(IN))
66 NPW 16 4 TI 6AL-4V MA SUMP R.T. 60CPM R=.3



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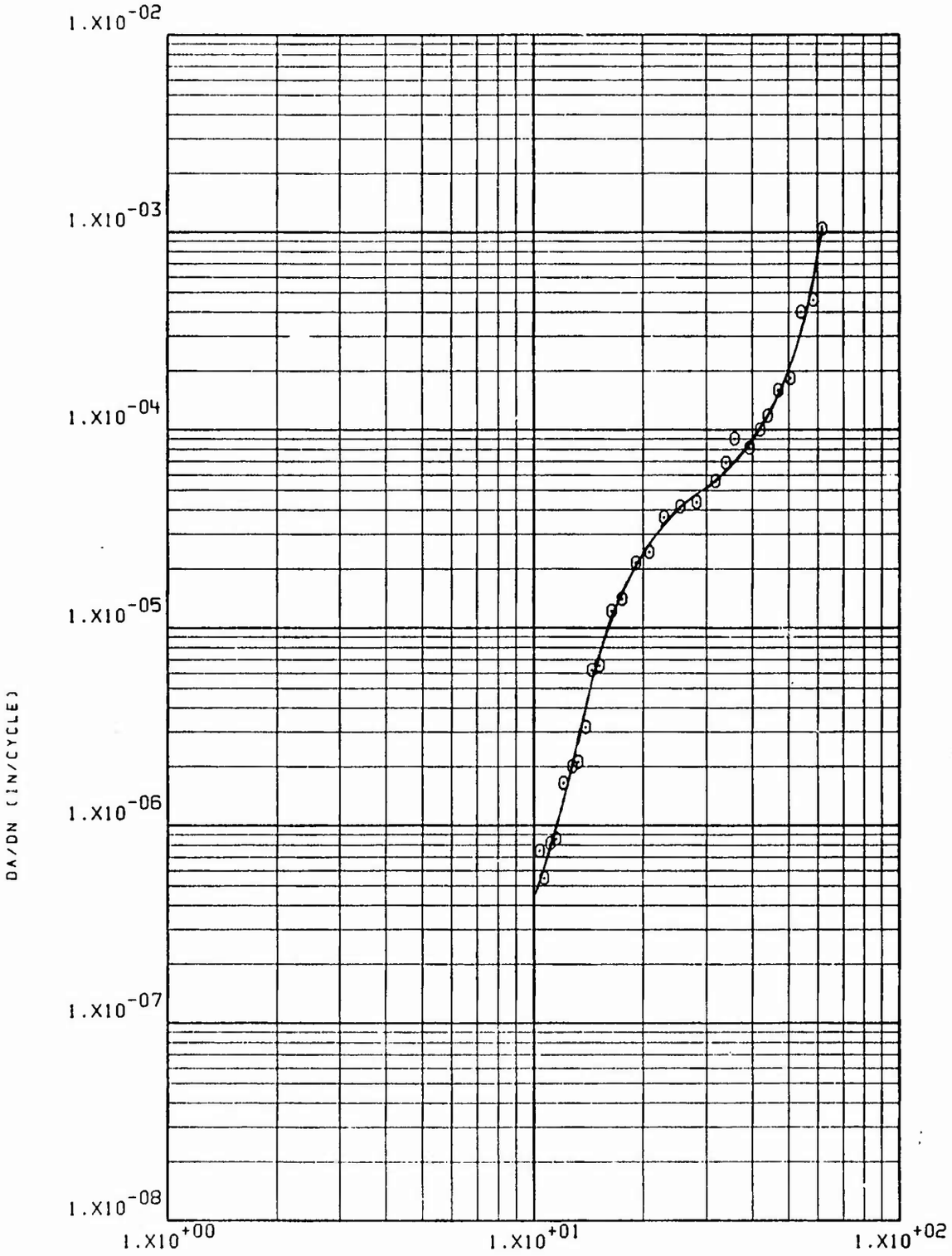
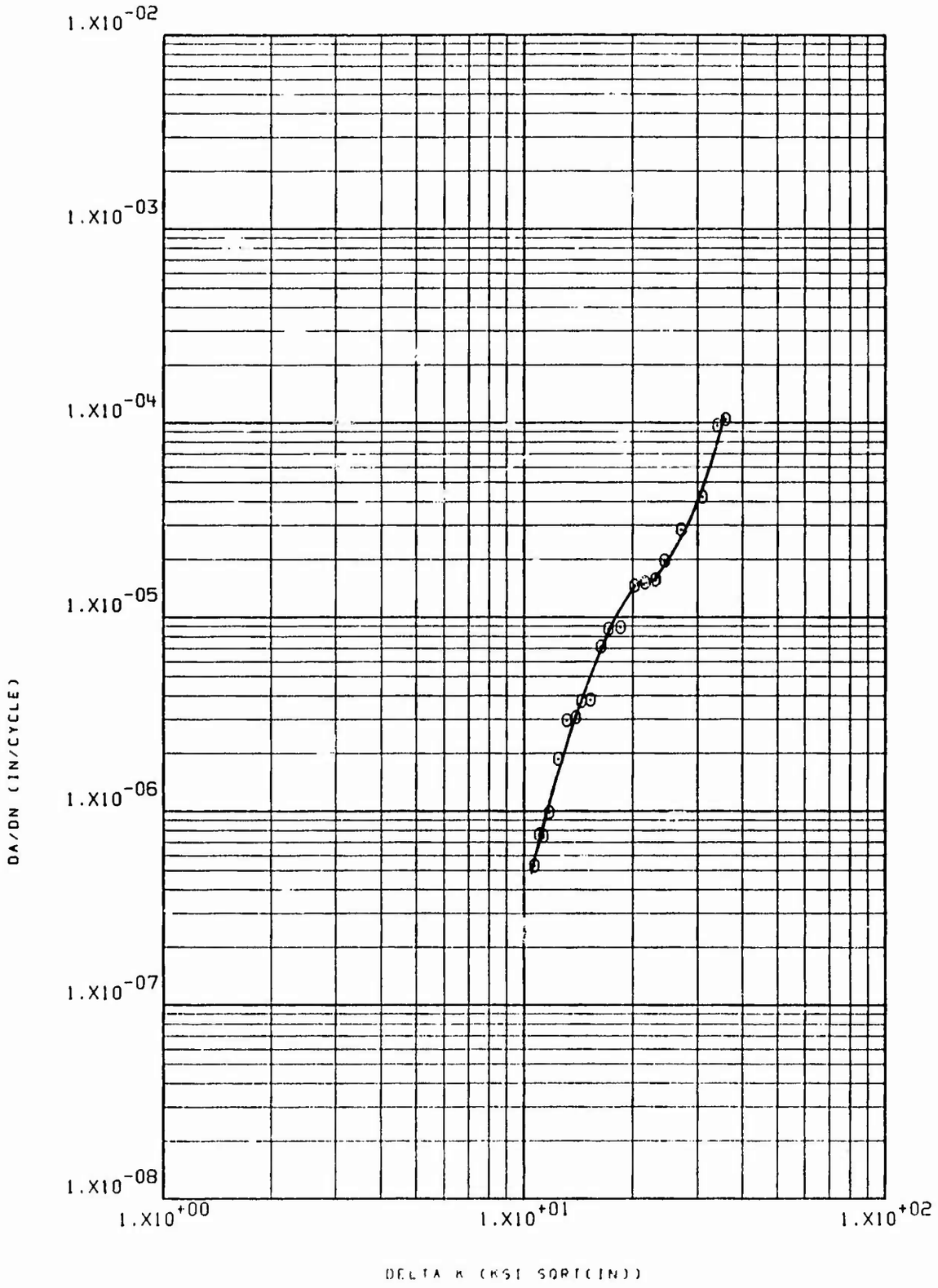
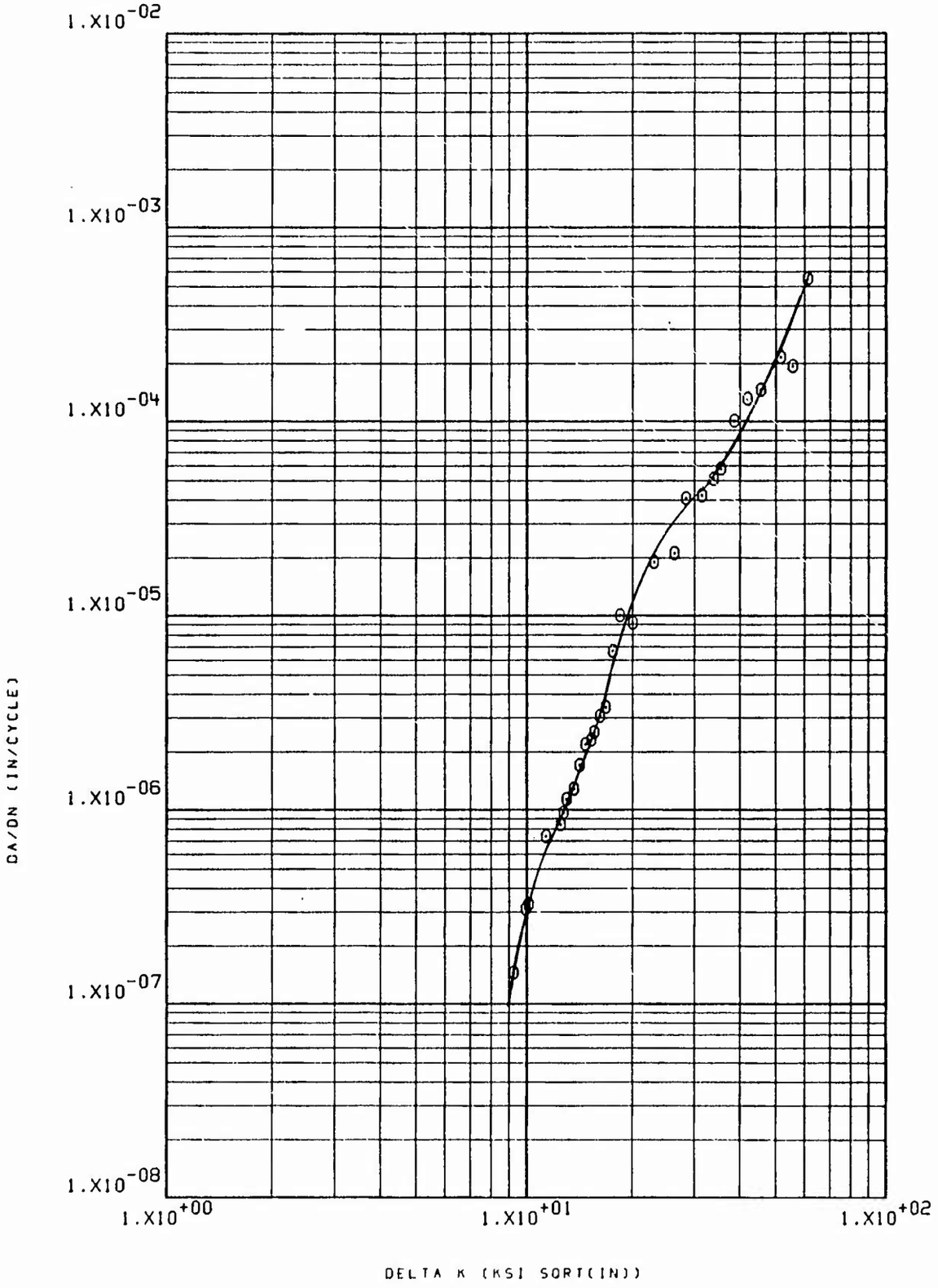


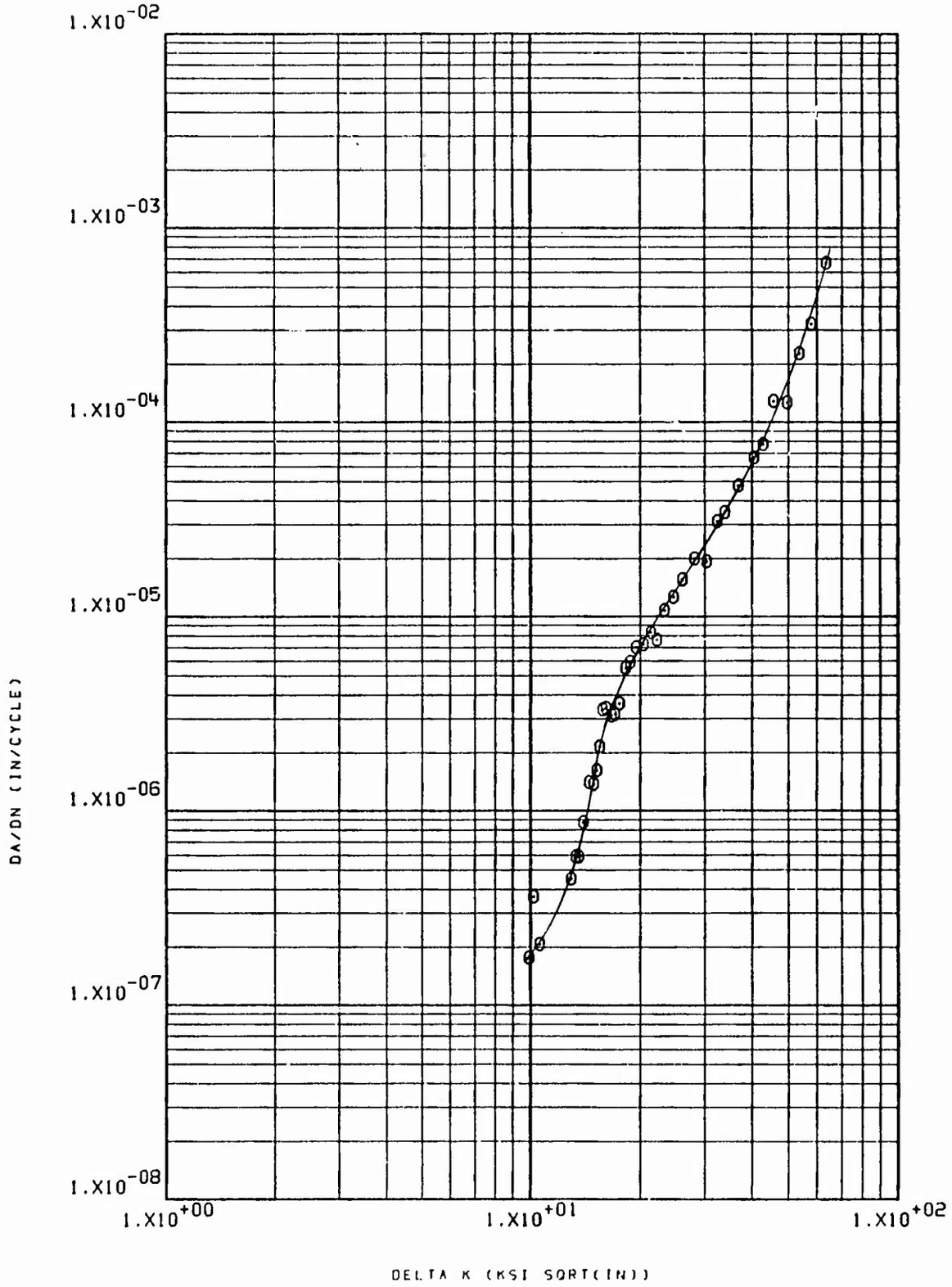
66 MAY 16 16 11-GAL 4V MA SUMP RT 60CPM R=.3



C7 NWP 23 1 CAL 4V RA LHA 1800PM R.T. R .5



67 NWP 29-2 TI 6AL-4V DBTC SUMP 60CPM R.T. R=.08



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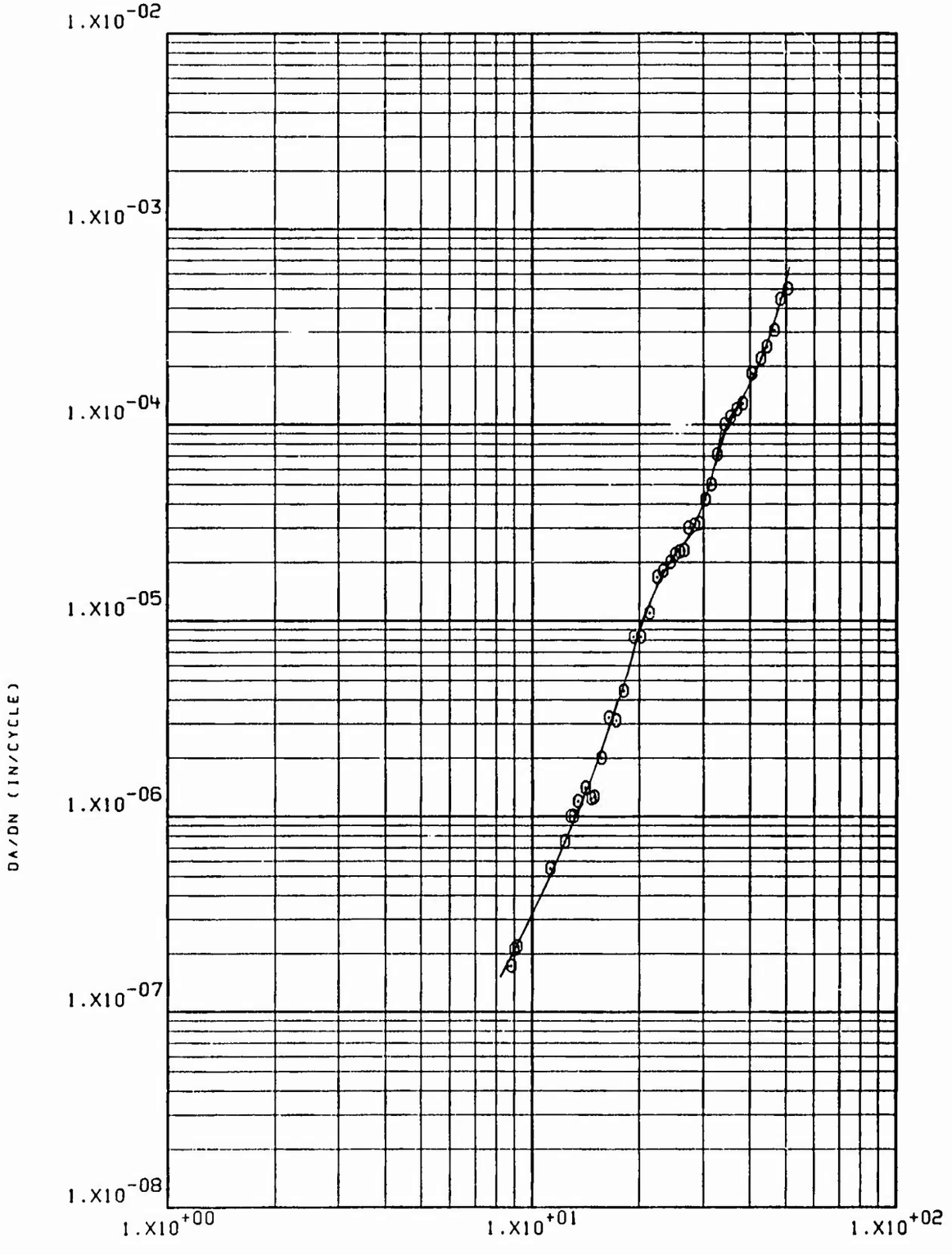

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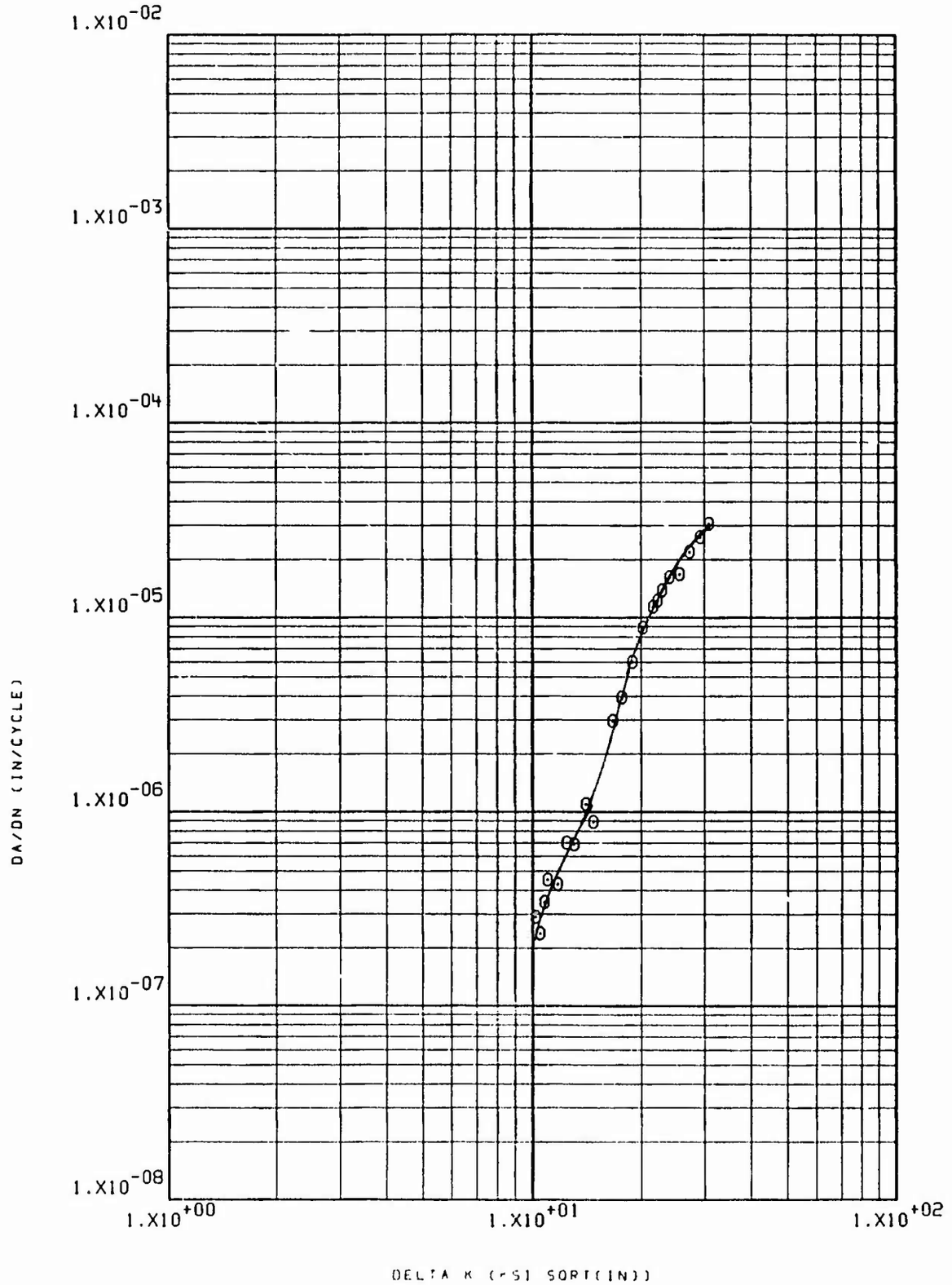
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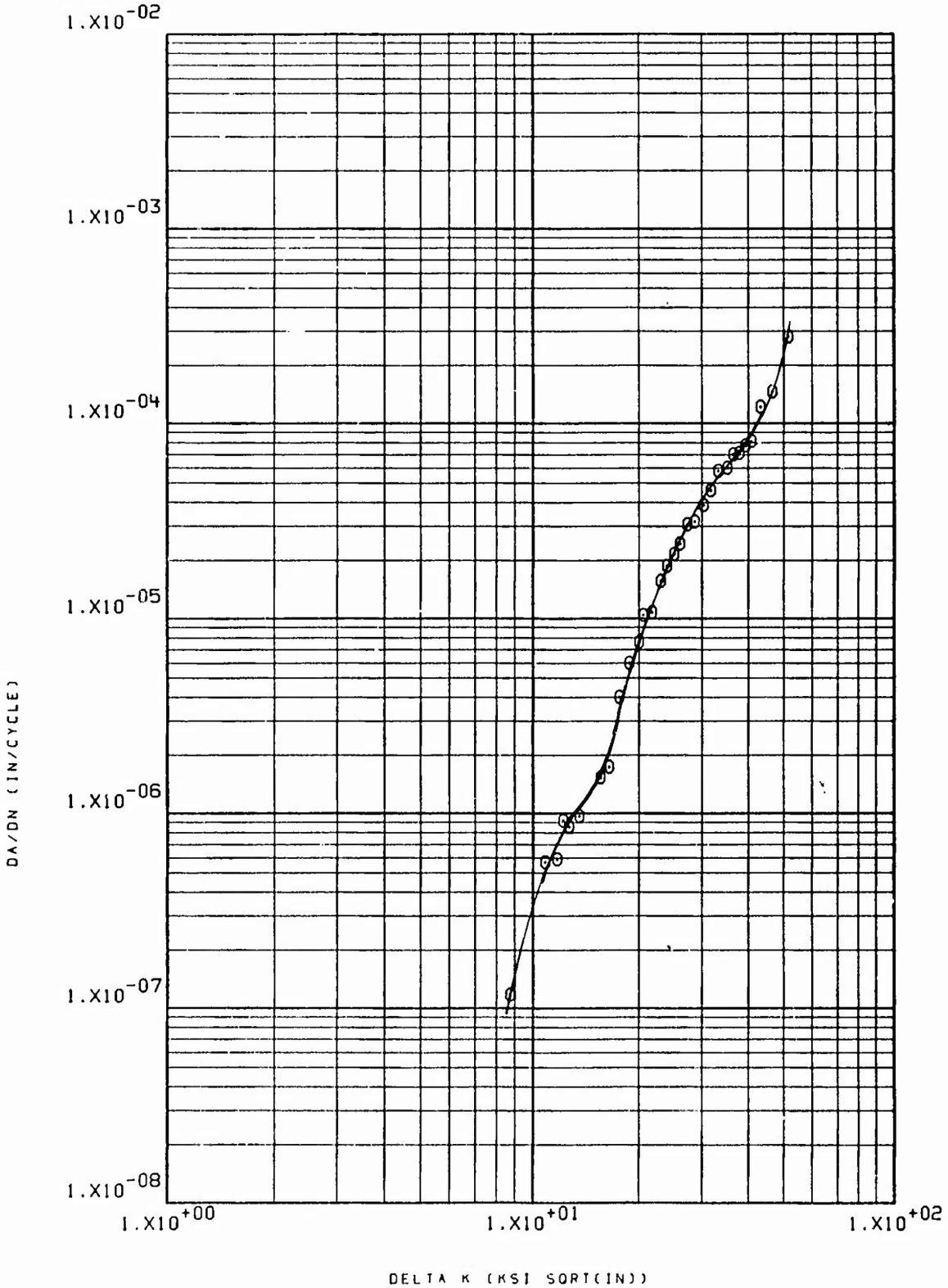
1.X10-08
DA/DN (IN/CYCLE)
1.X10+00
1.X10+01
1.X10+02
DELTA K (PSI SQRT(IN))
67 NWR 23-5
TI 6AL 4V RA
RT 360CPM R=.08



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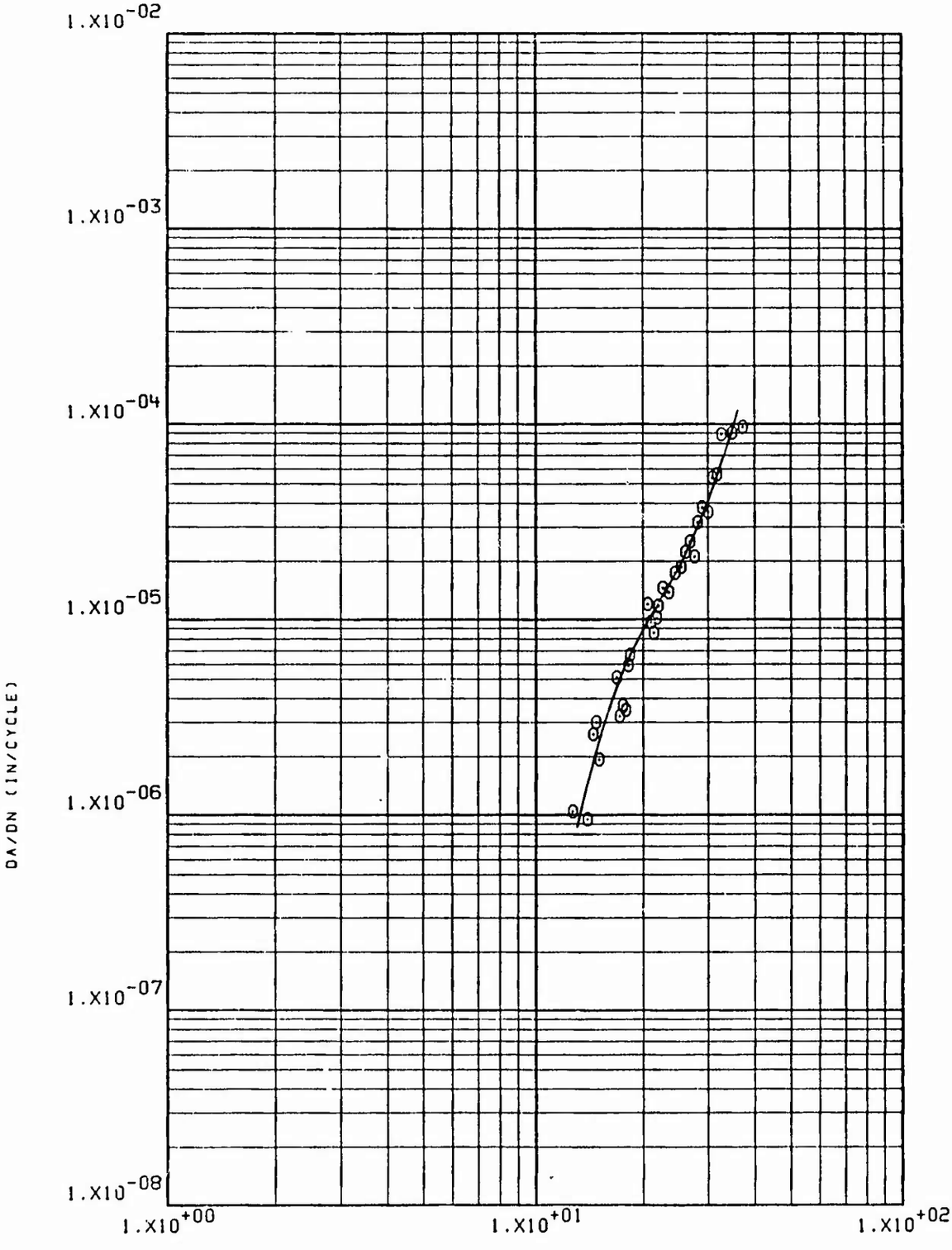

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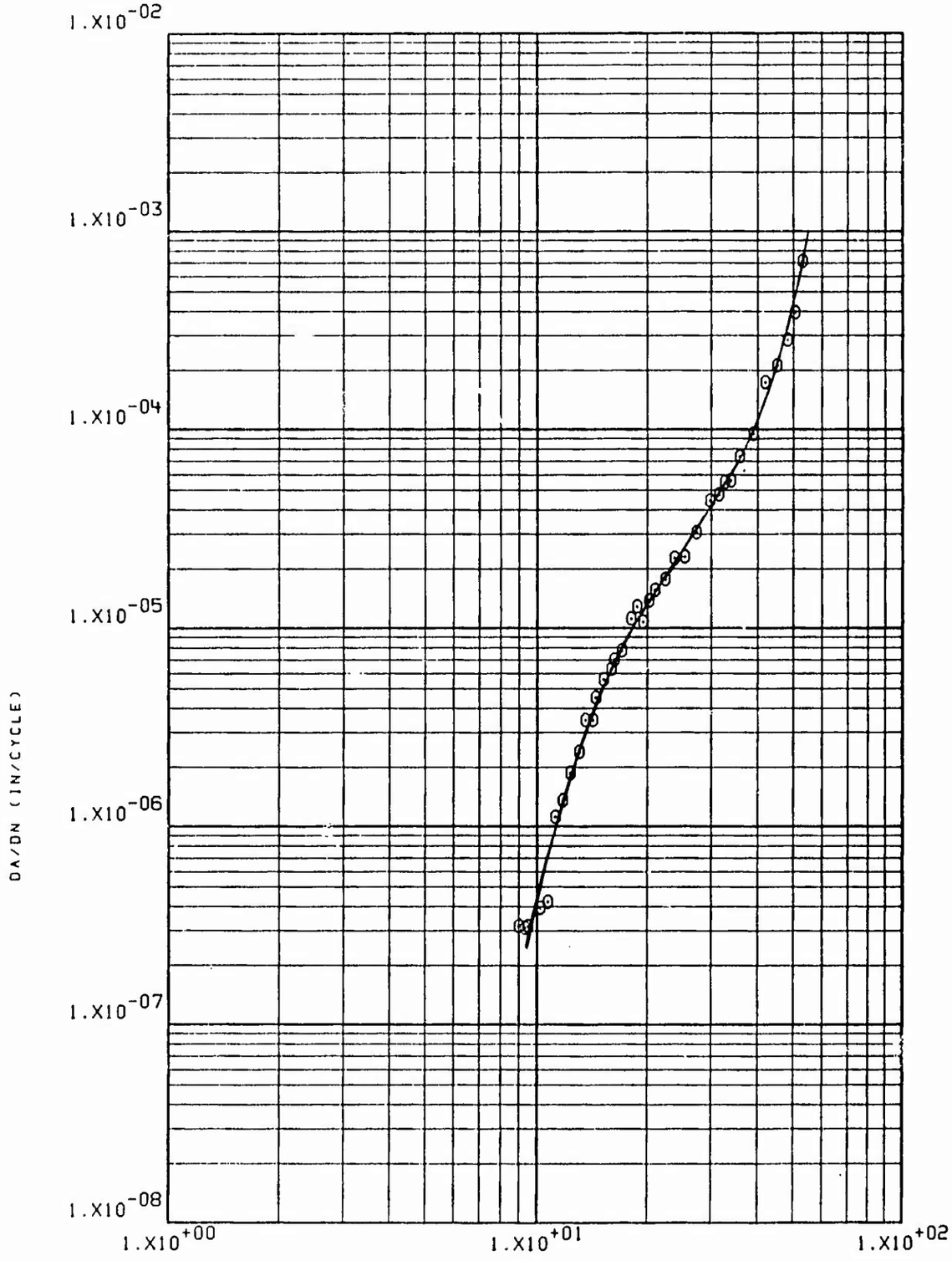
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DA/DN (IN/CYCLE)
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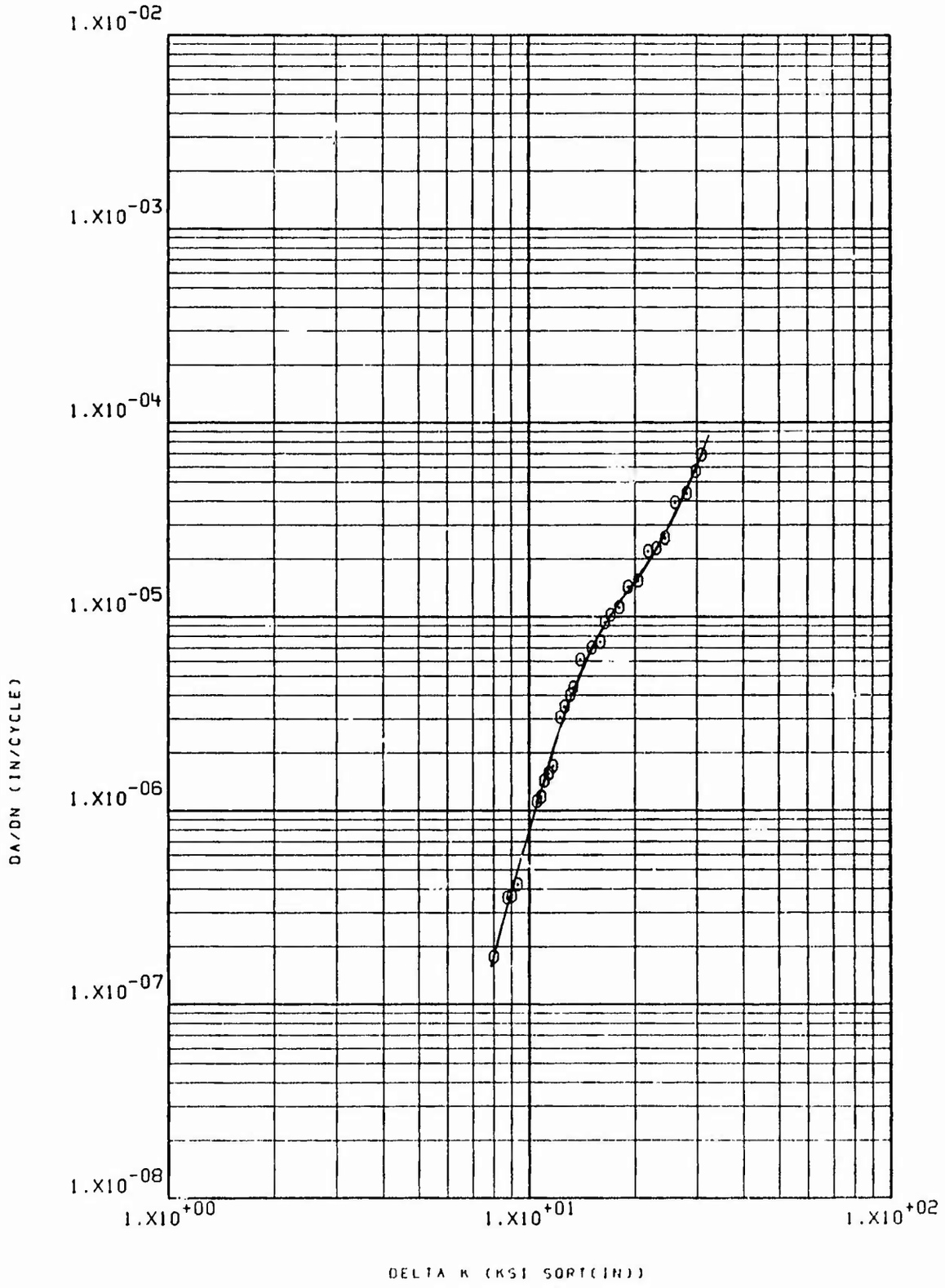

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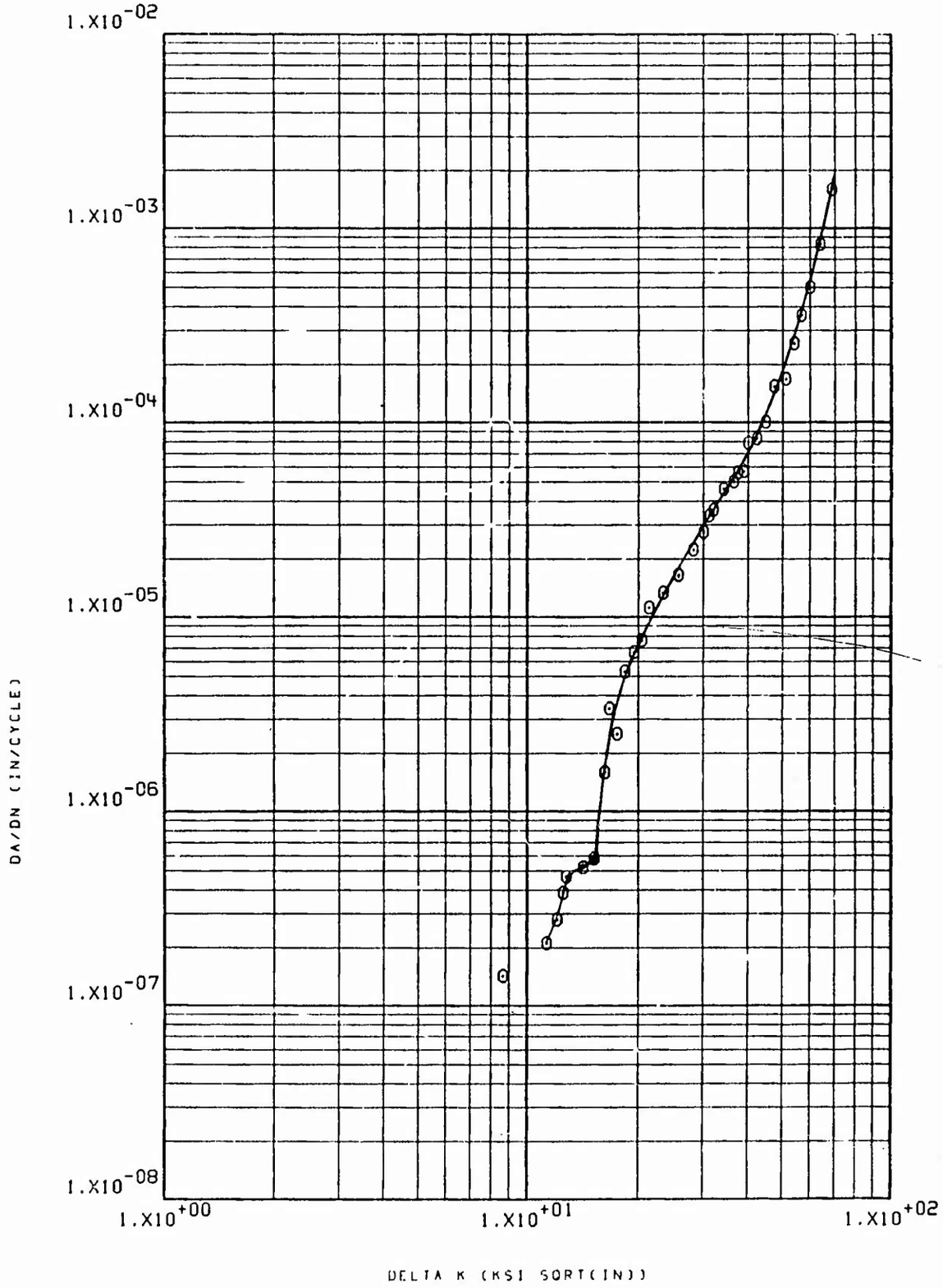
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1.X10-08
DA/DN (IN/CYCLE)
1.X10+00
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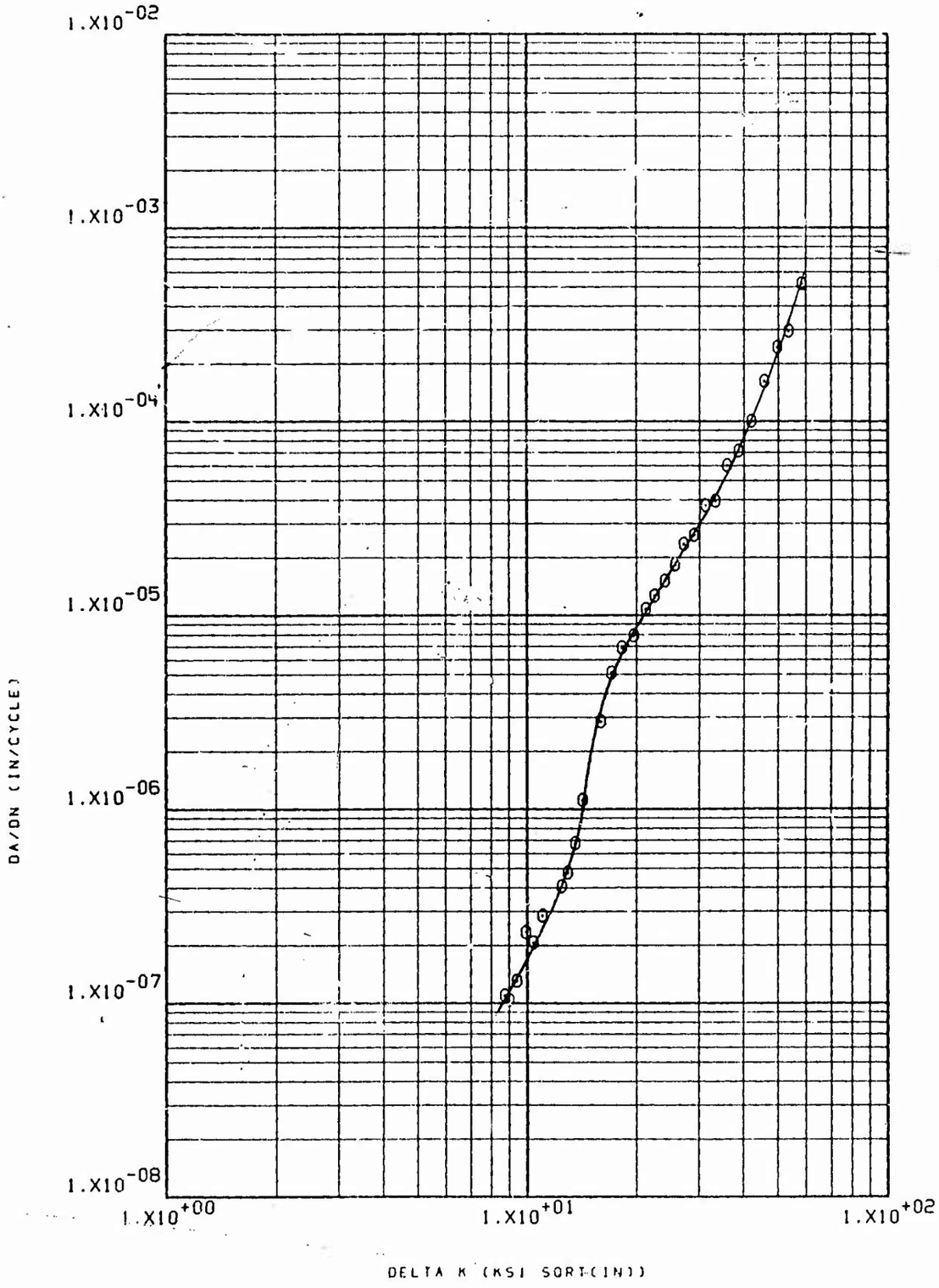

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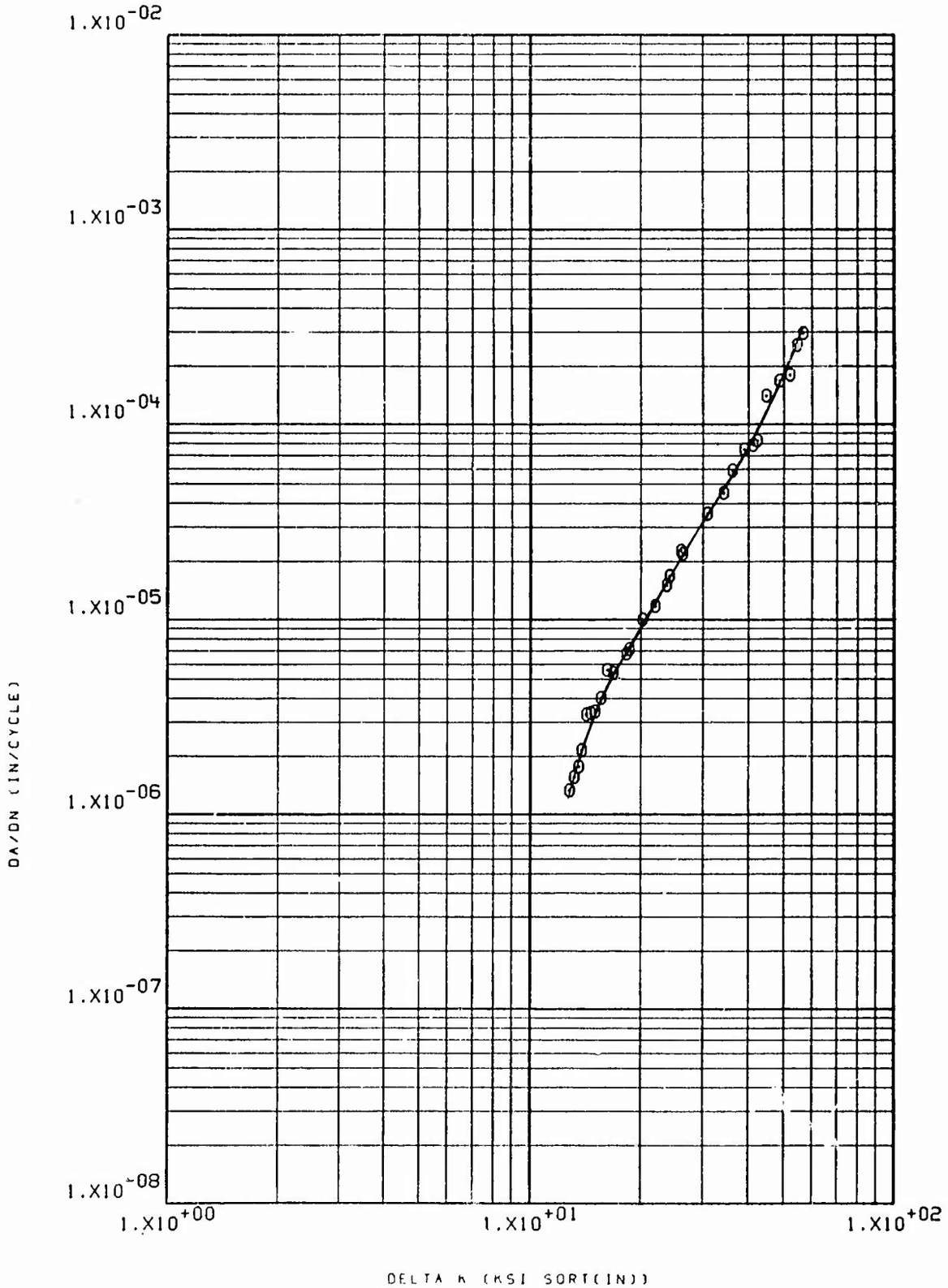

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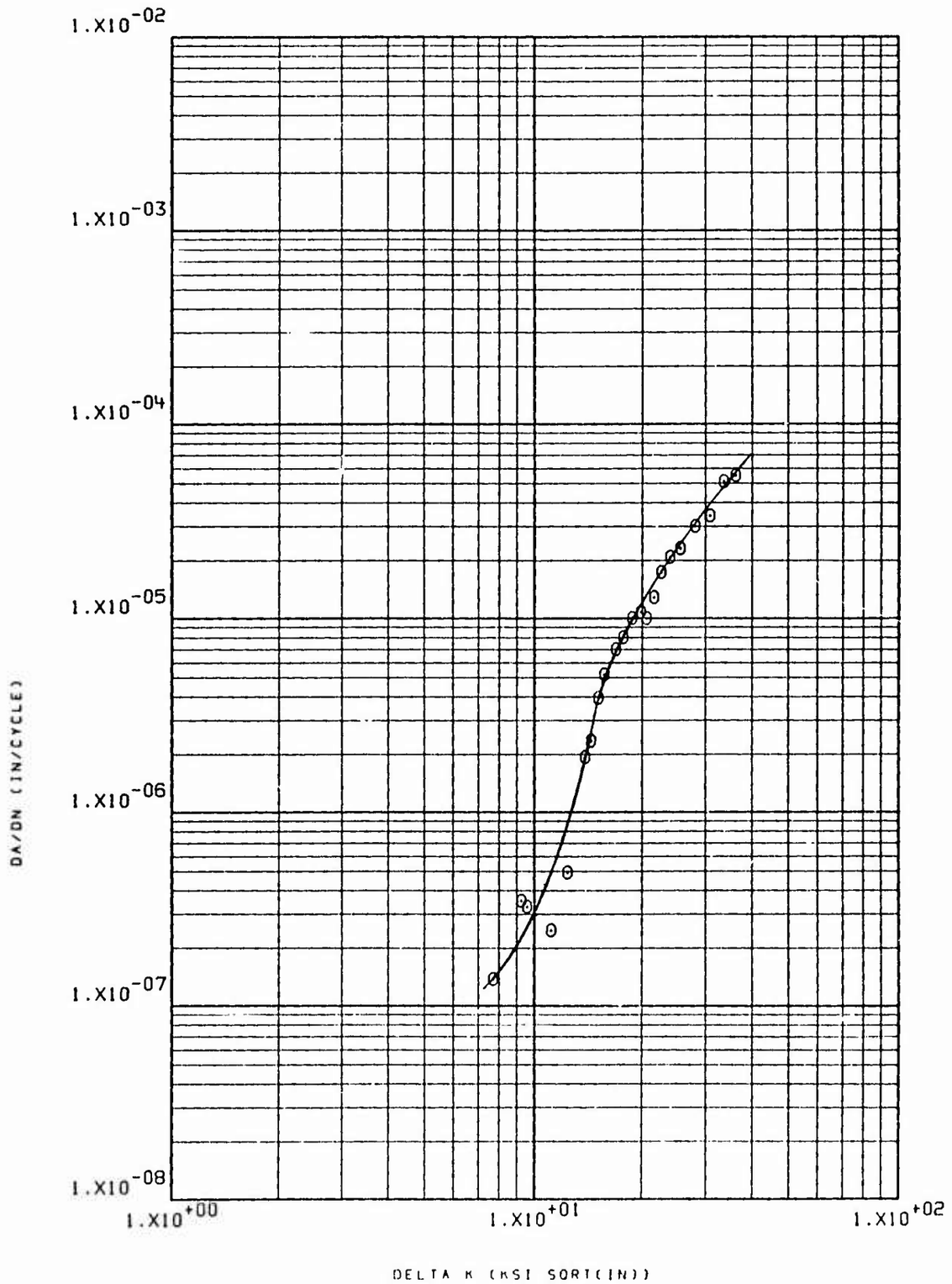

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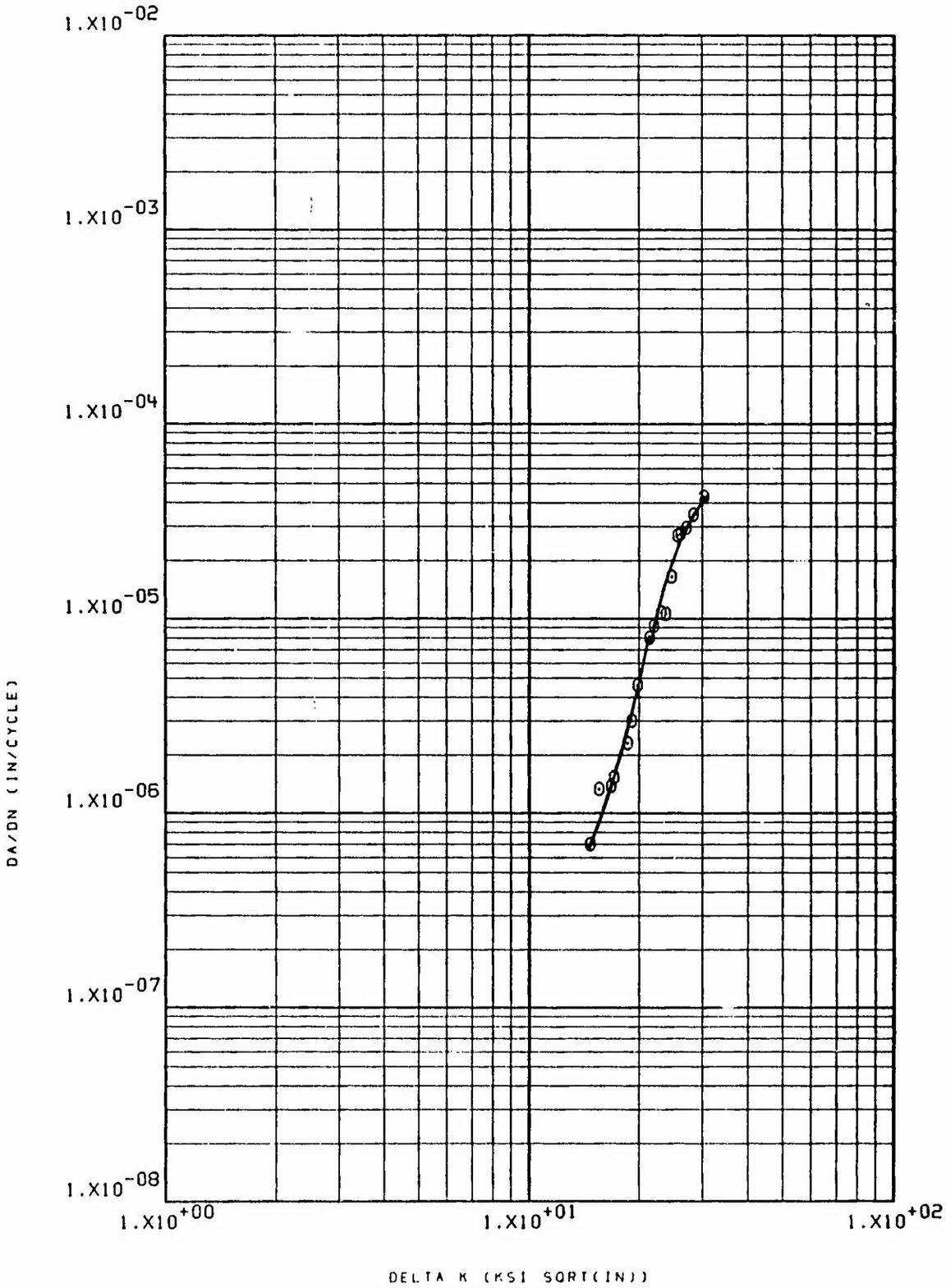
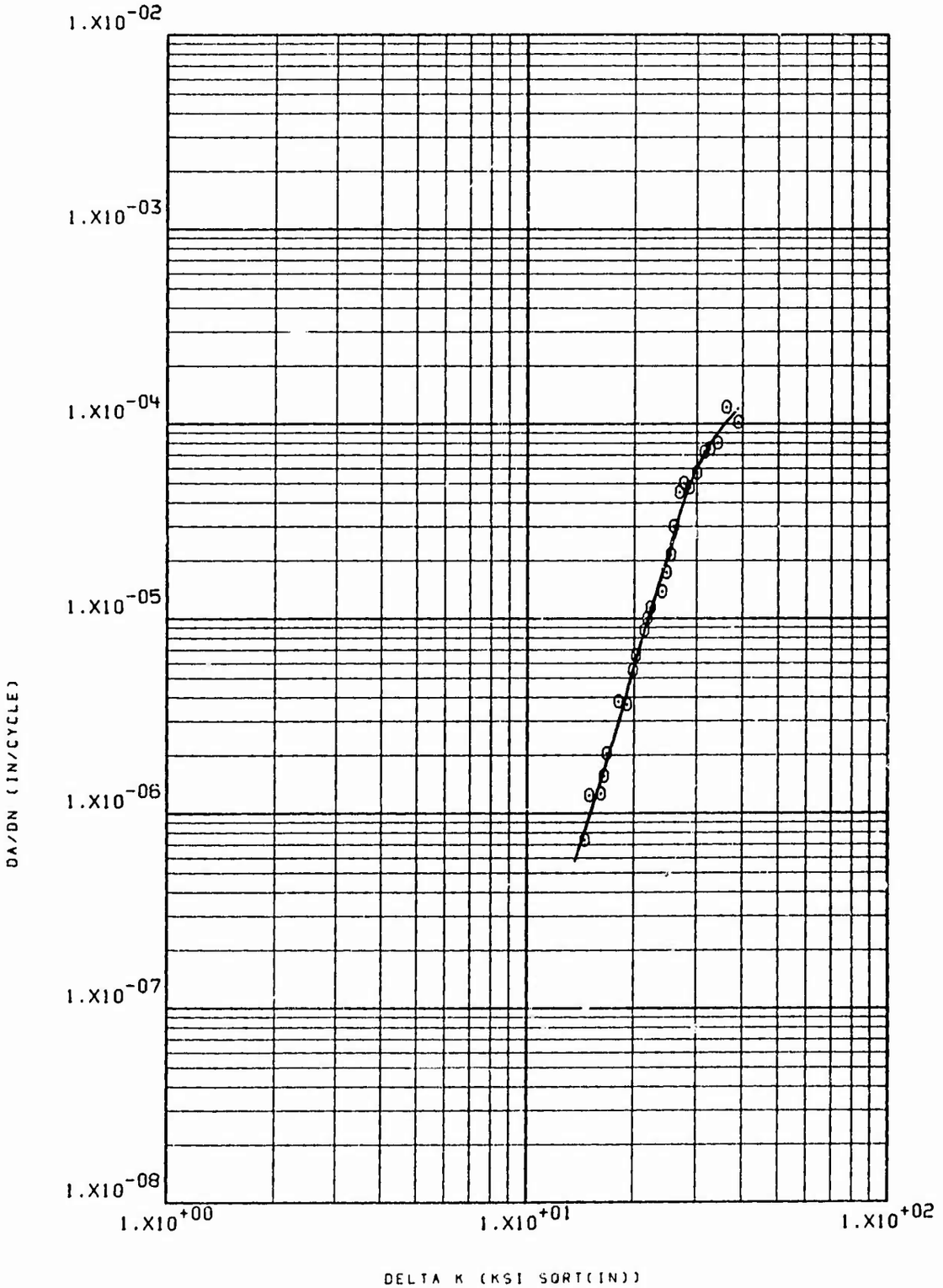


68 NWP 32 10 TI 6AL 4V RA SUMP RT R-.08 60CPM



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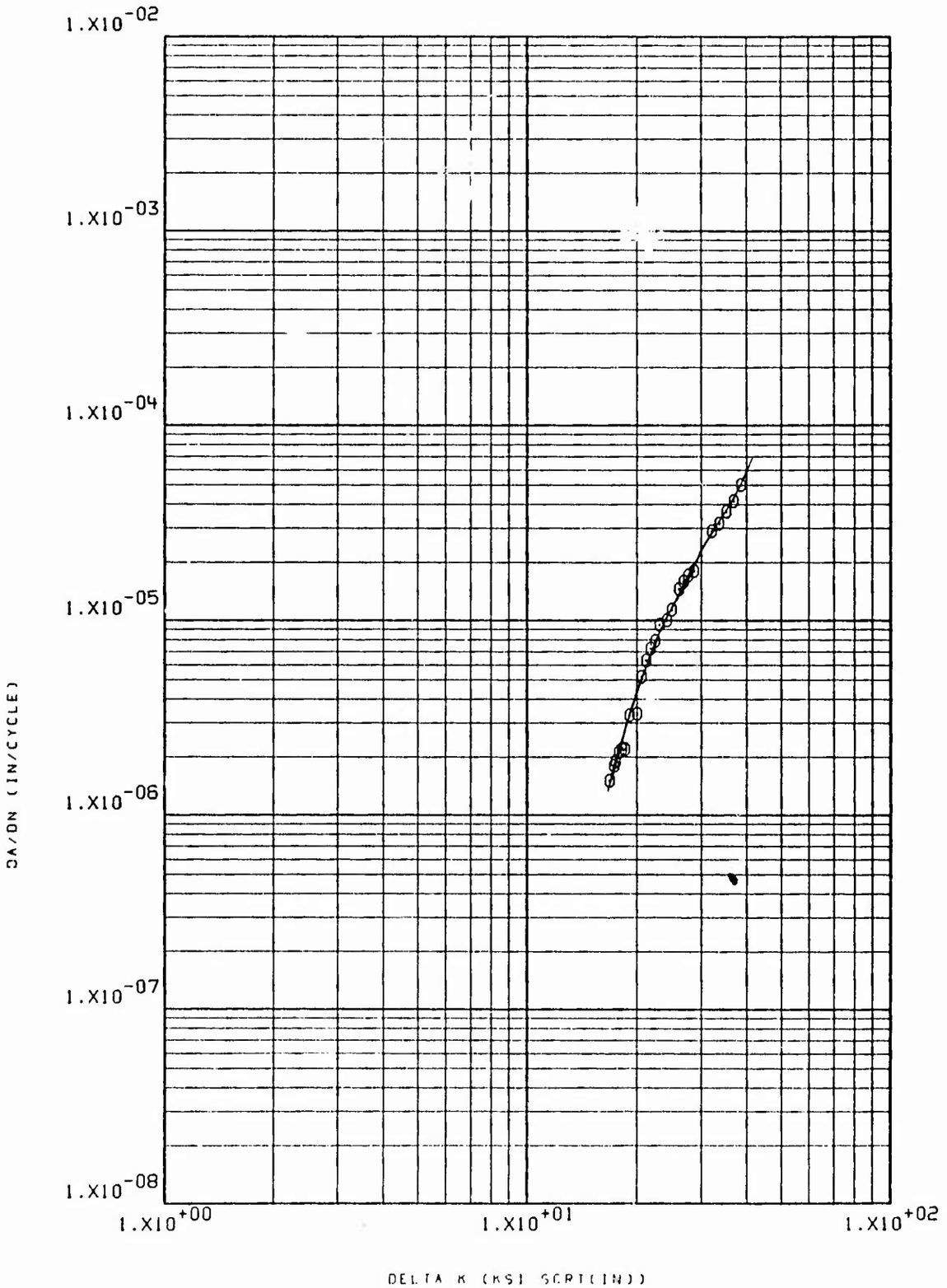

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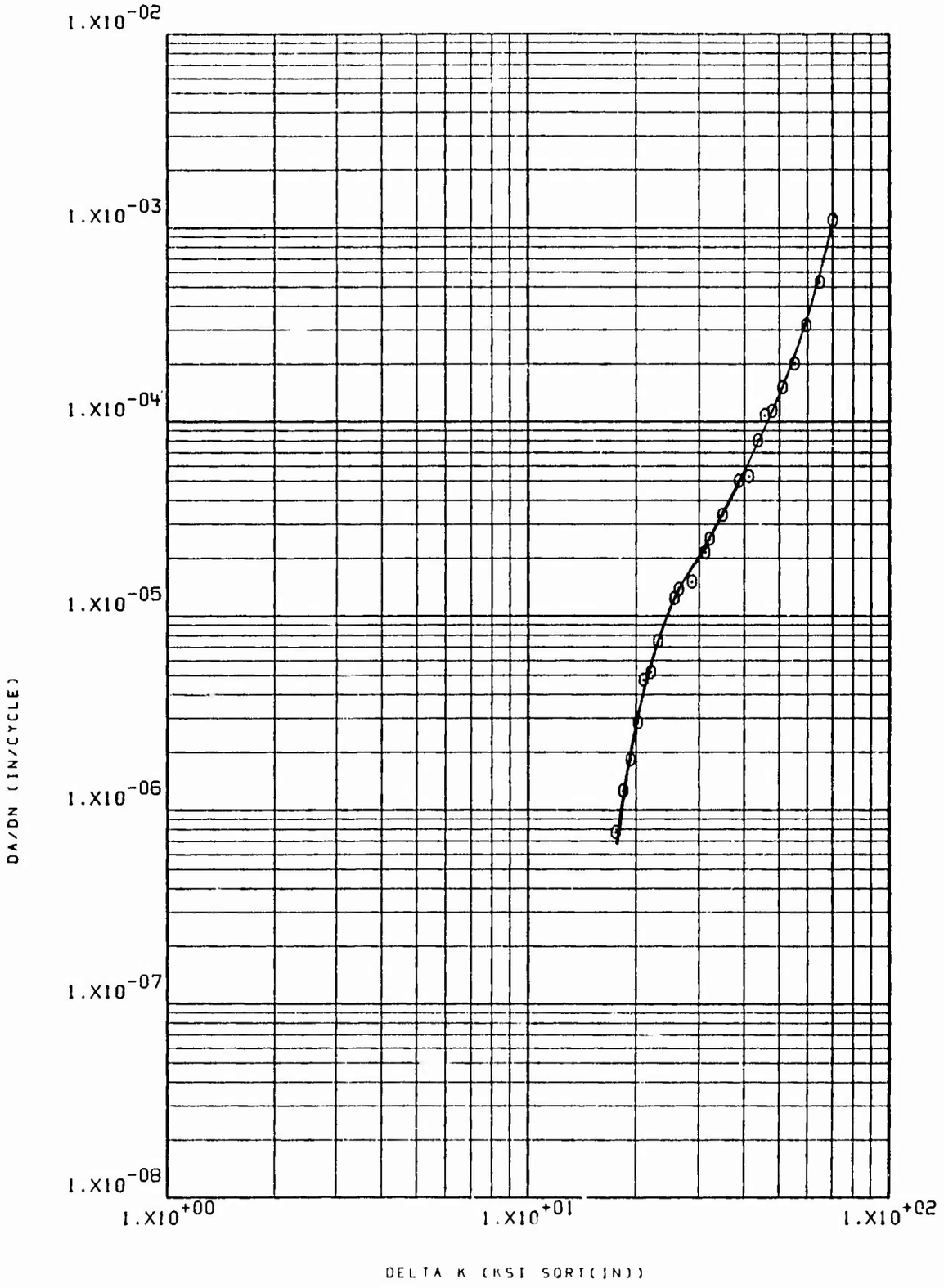

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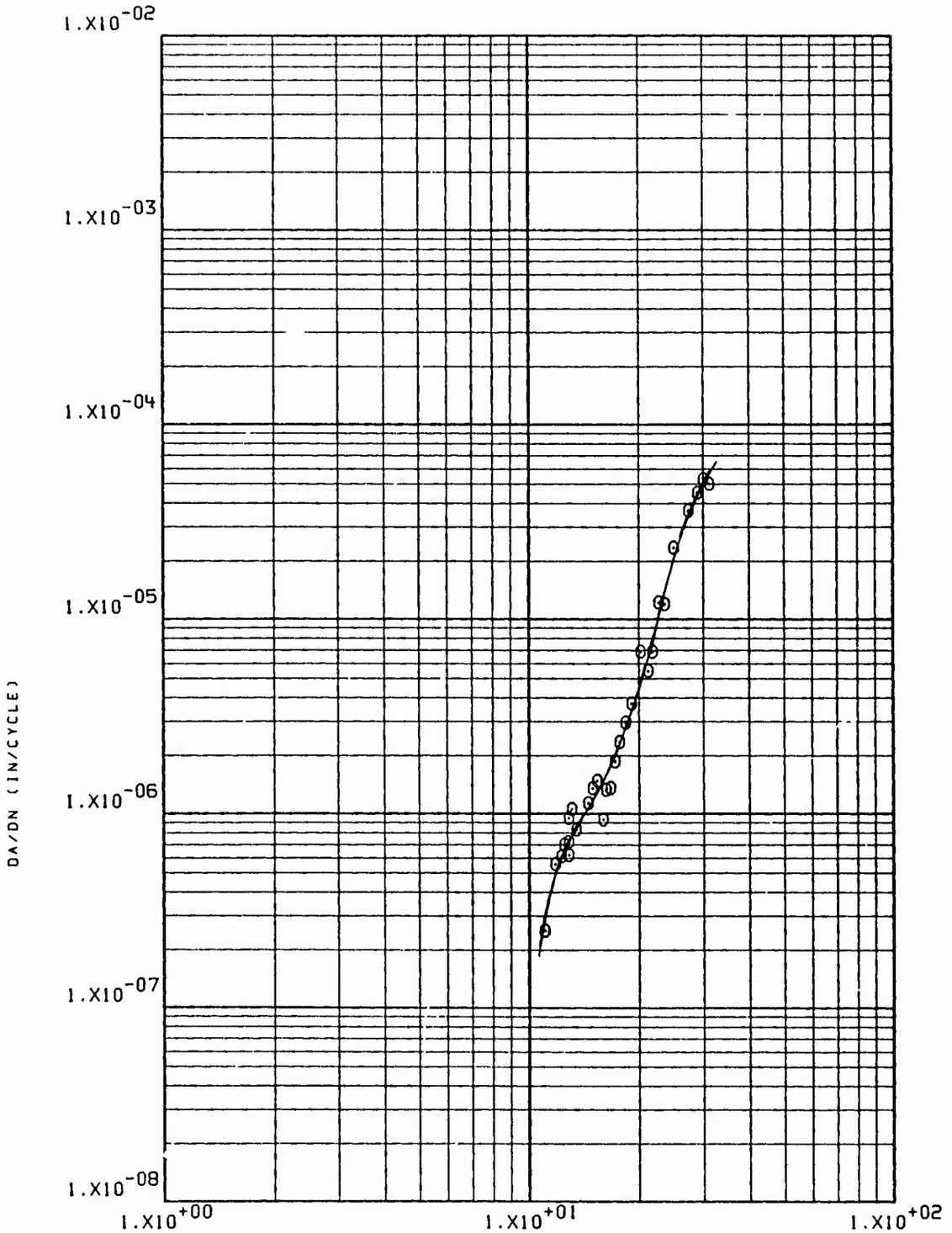

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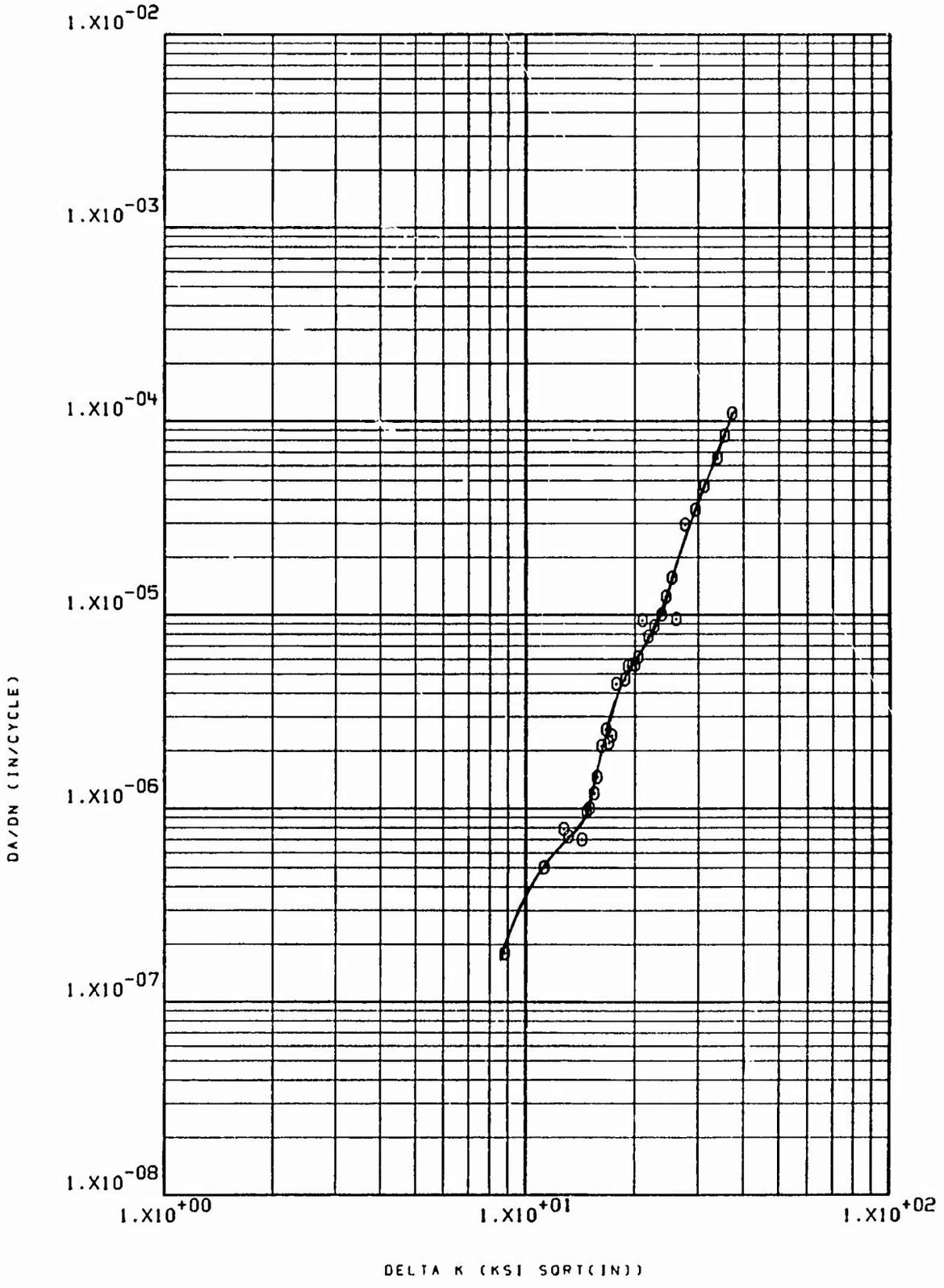

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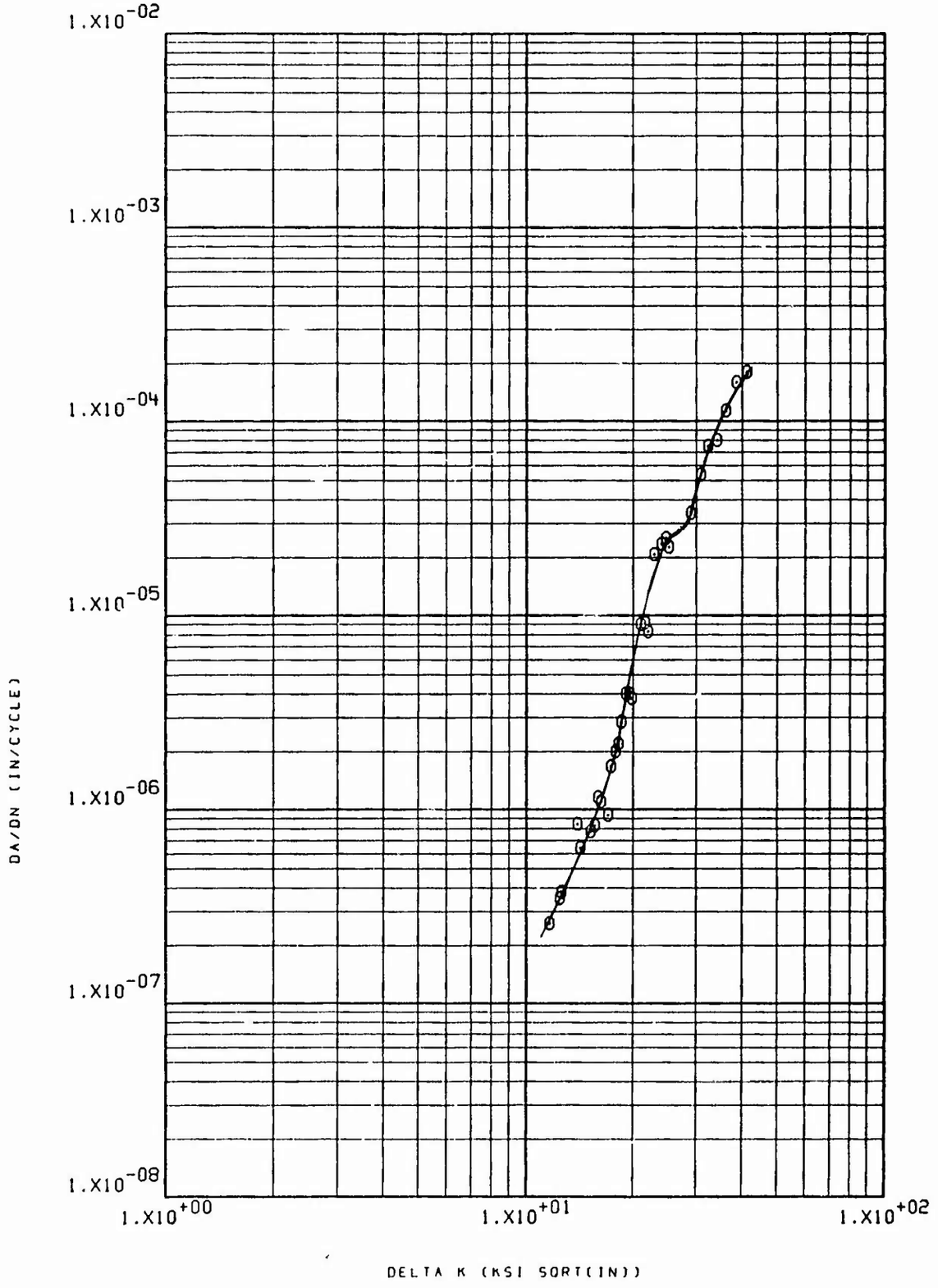

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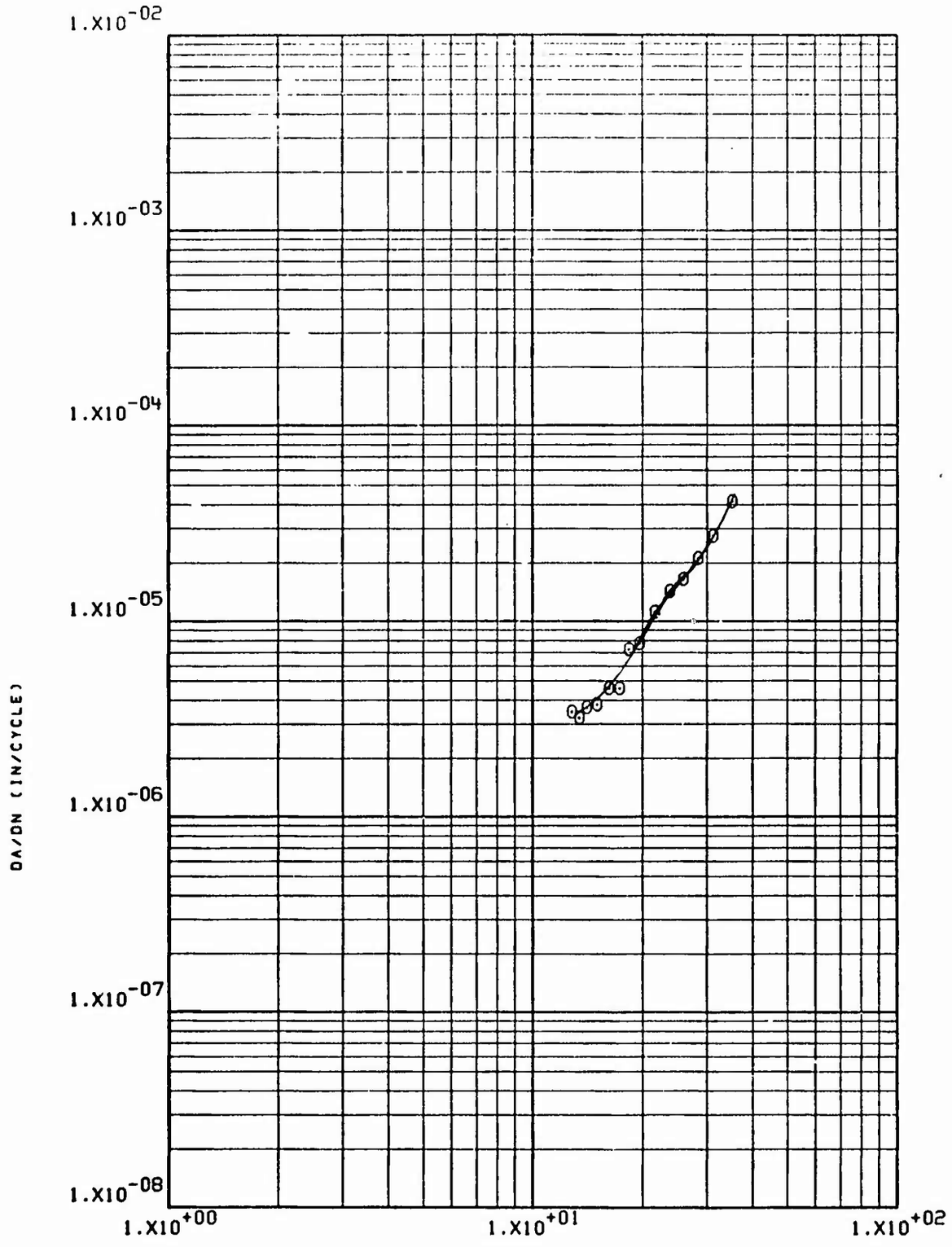

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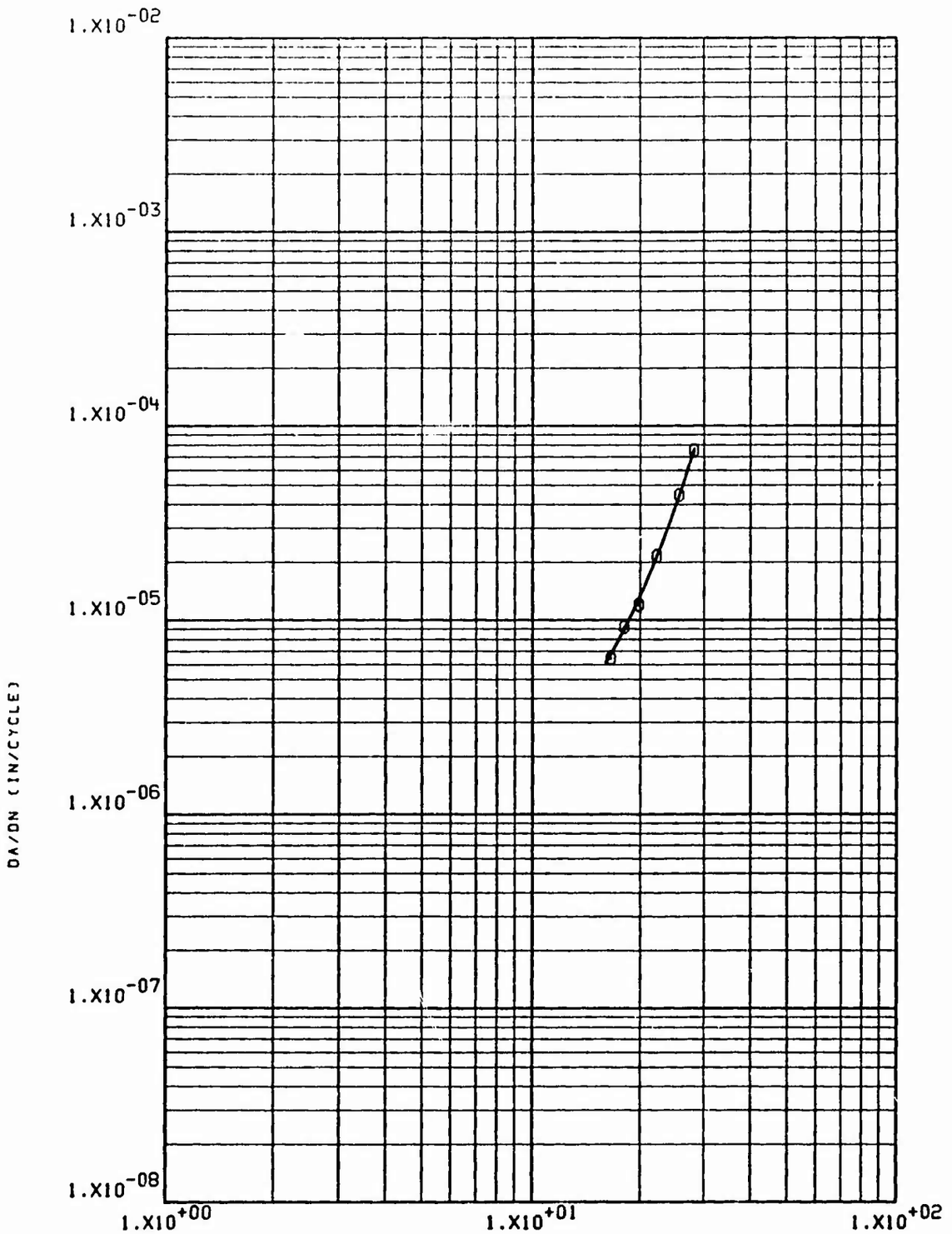

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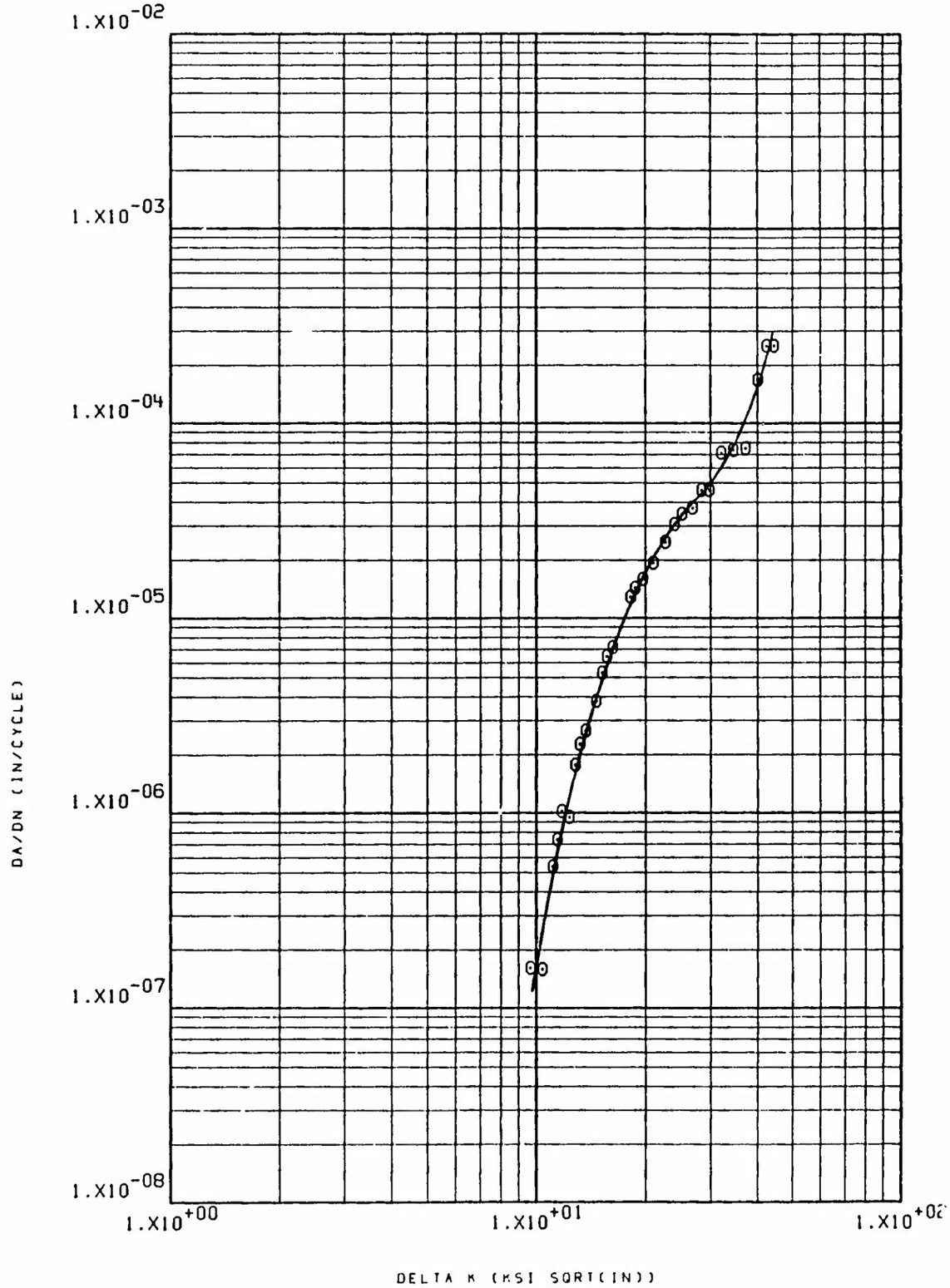
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1.X10-08
DA/DN (IN/CYCLE)
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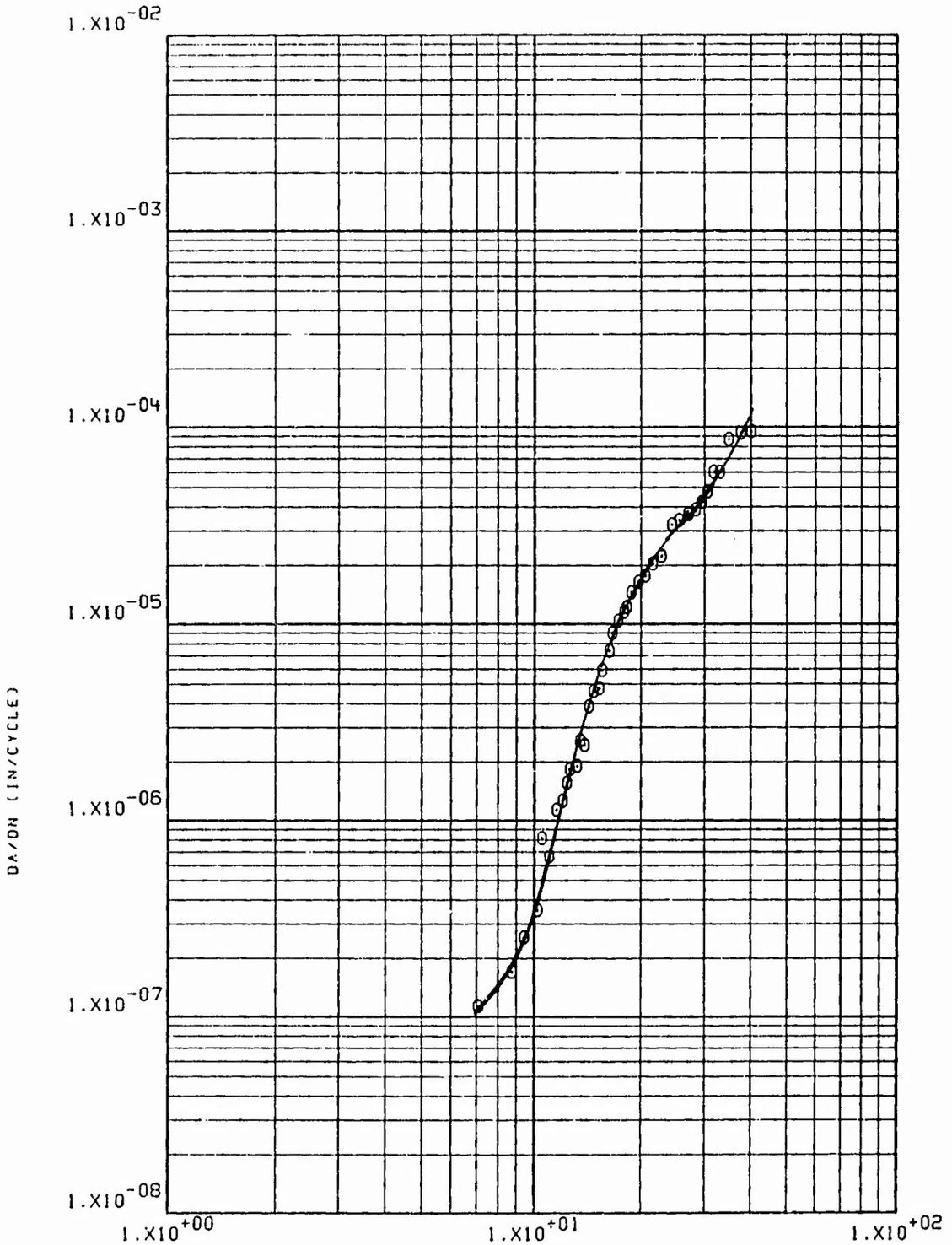
DELTA K (KSI SQRT(IN))
72 NRW 46-24 TI-6AL-4V DBTC SUMP RT 60CPM R=.08



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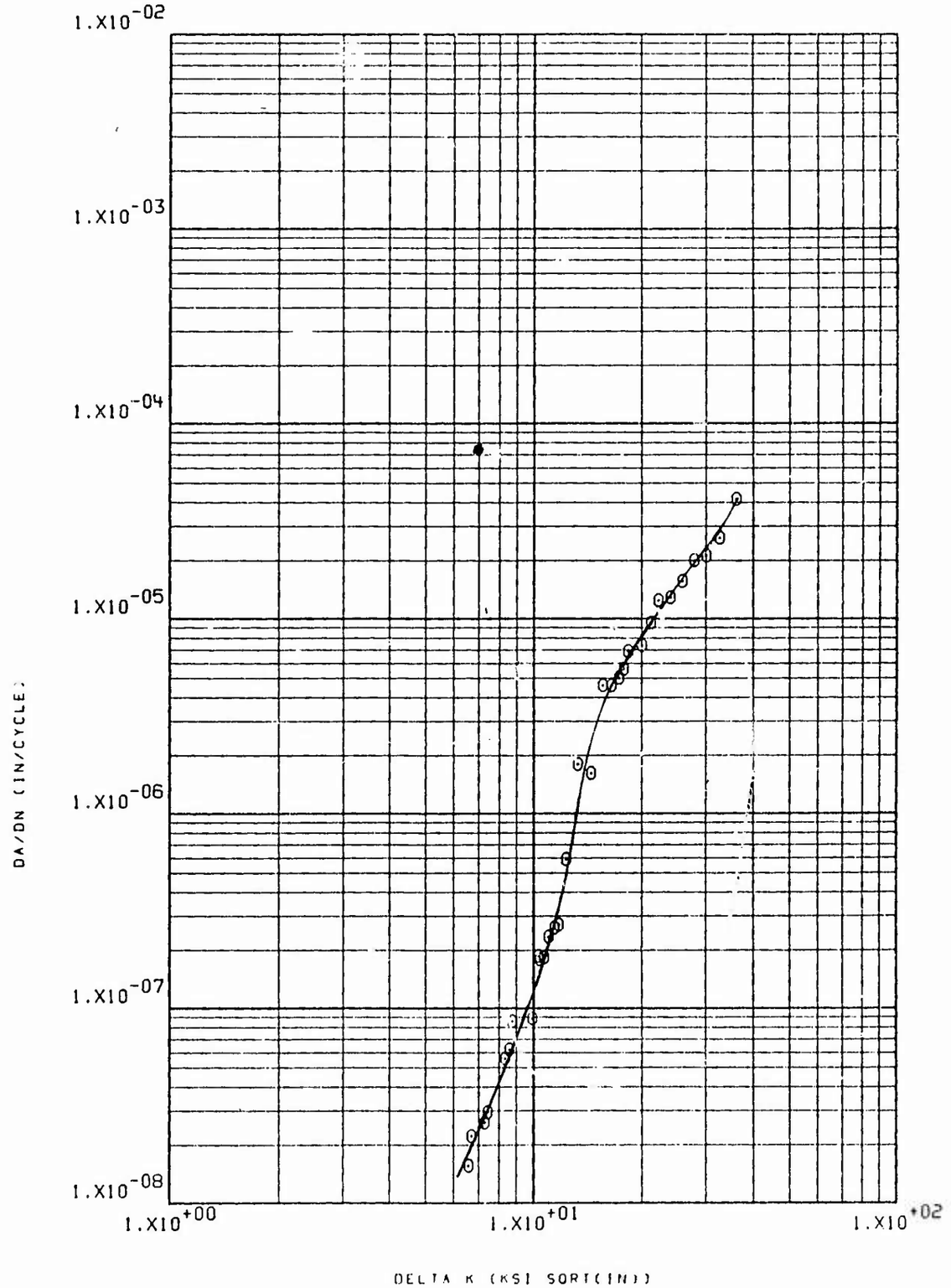

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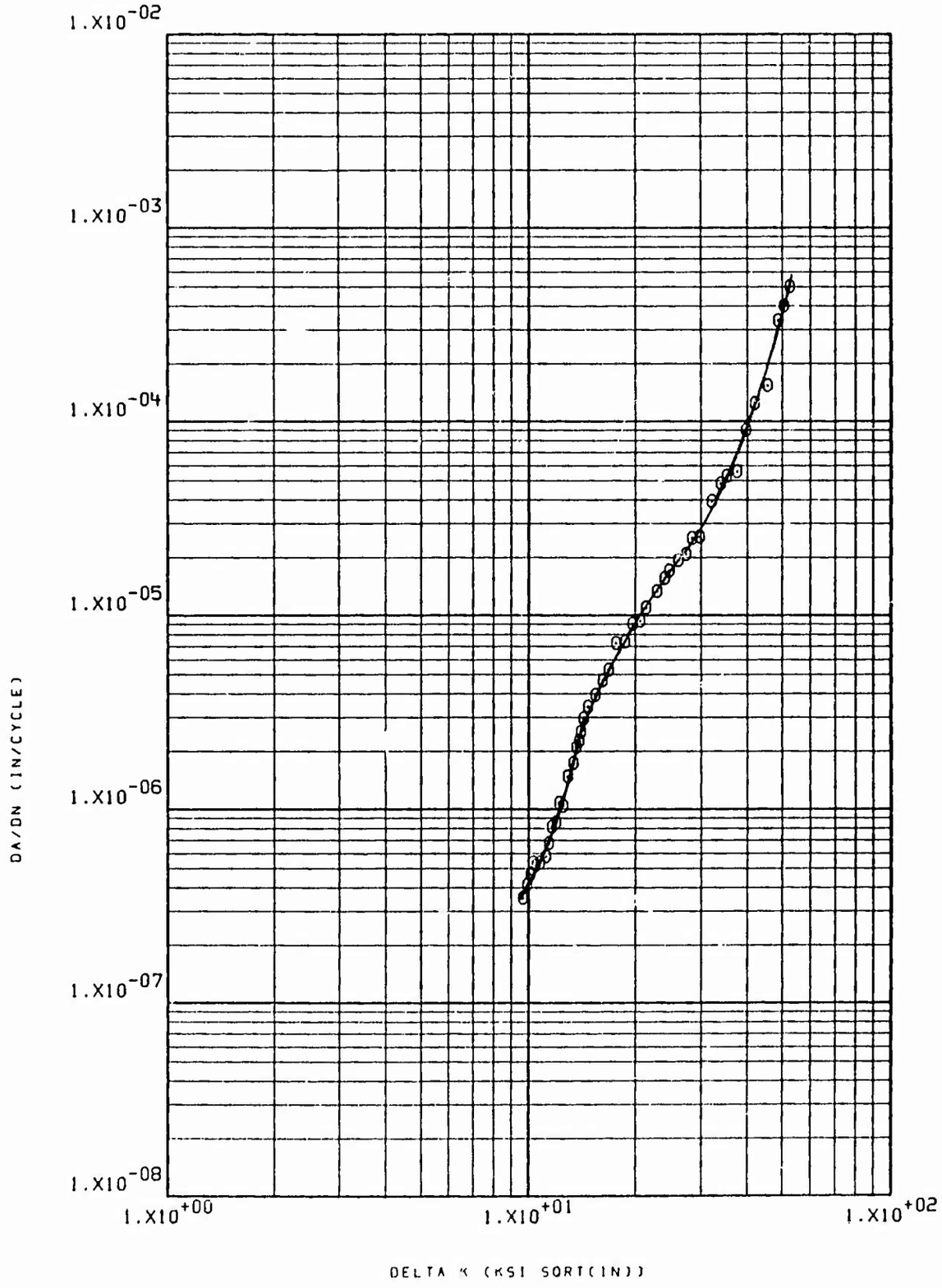

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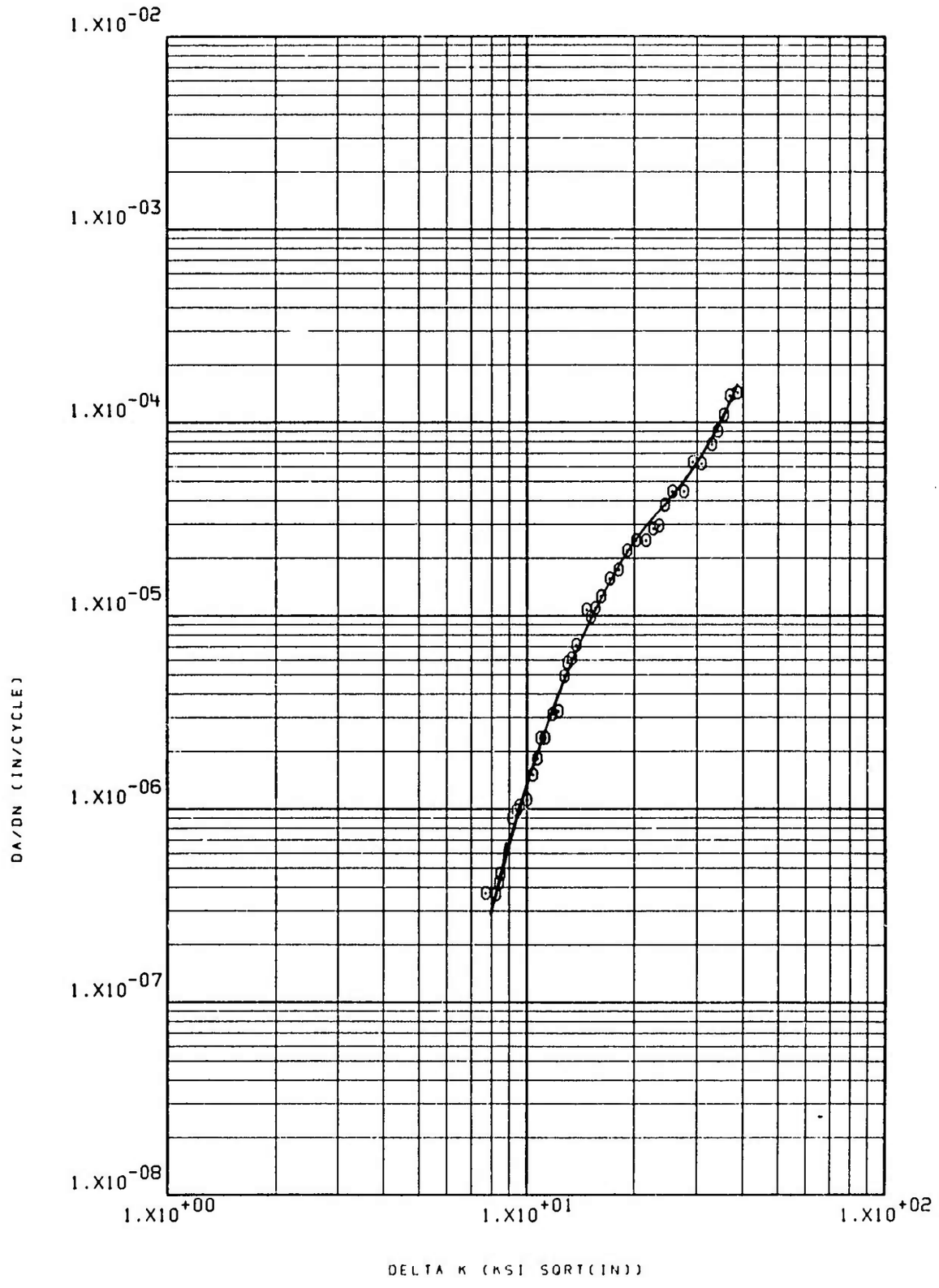

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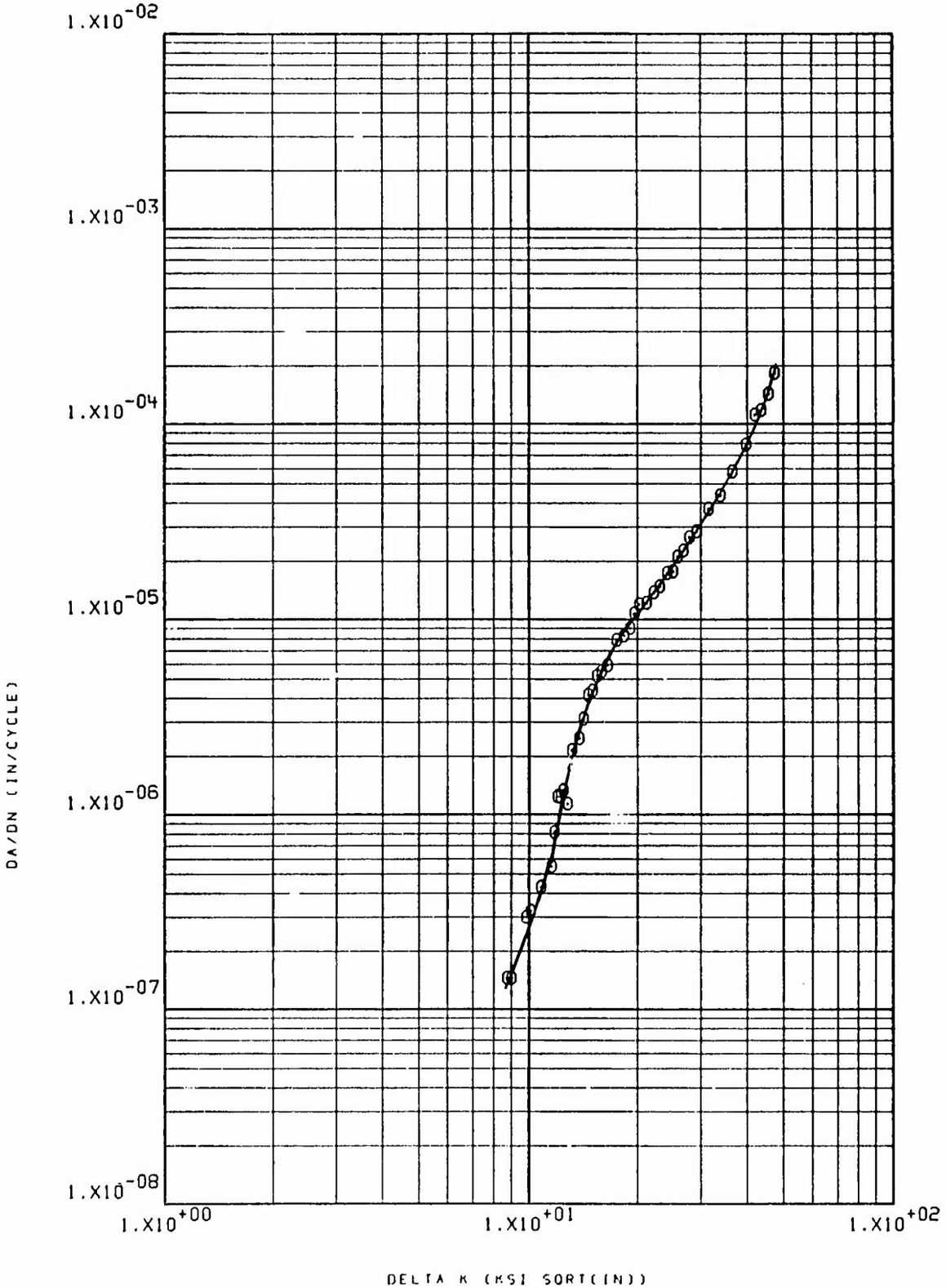

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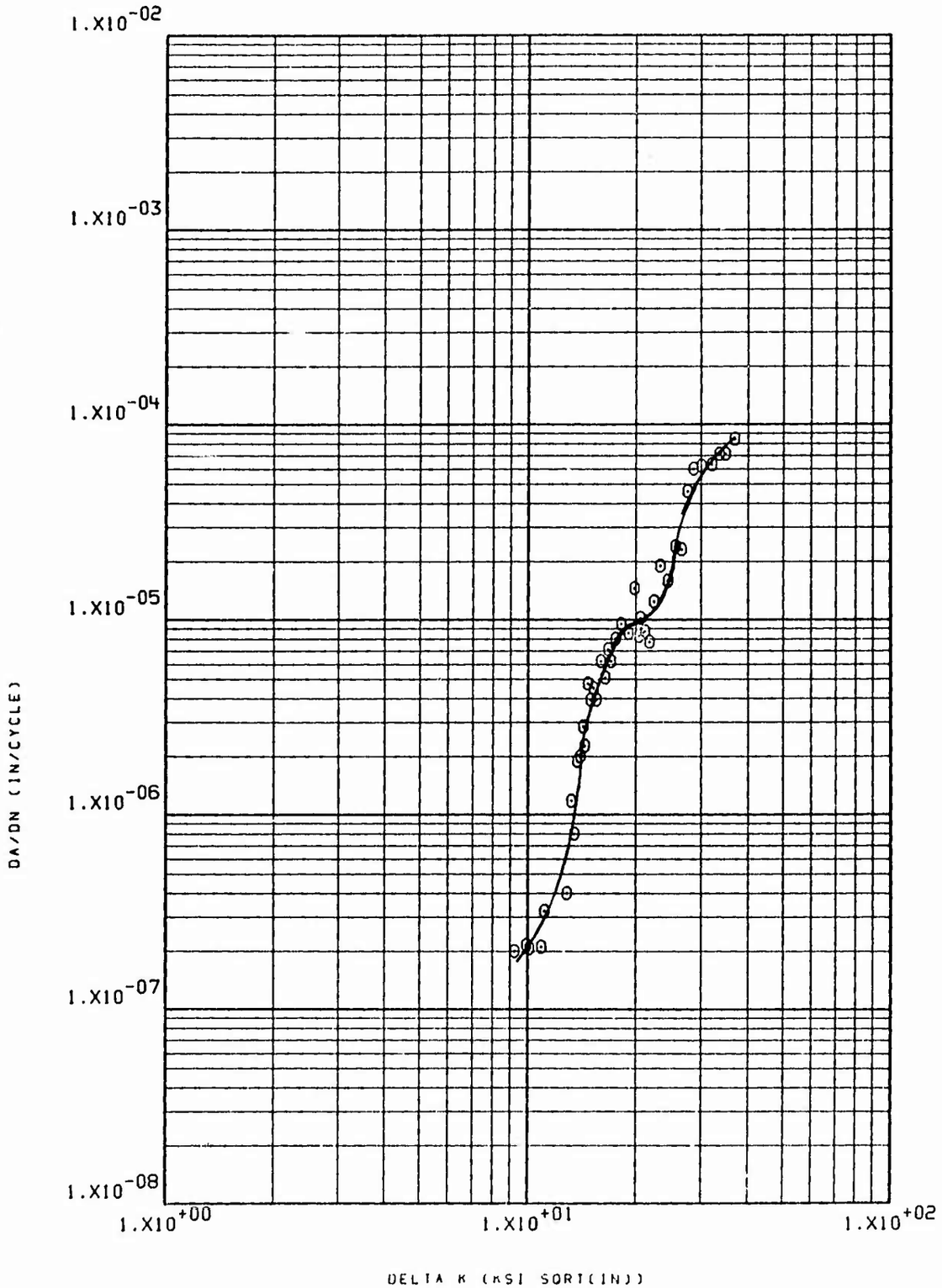

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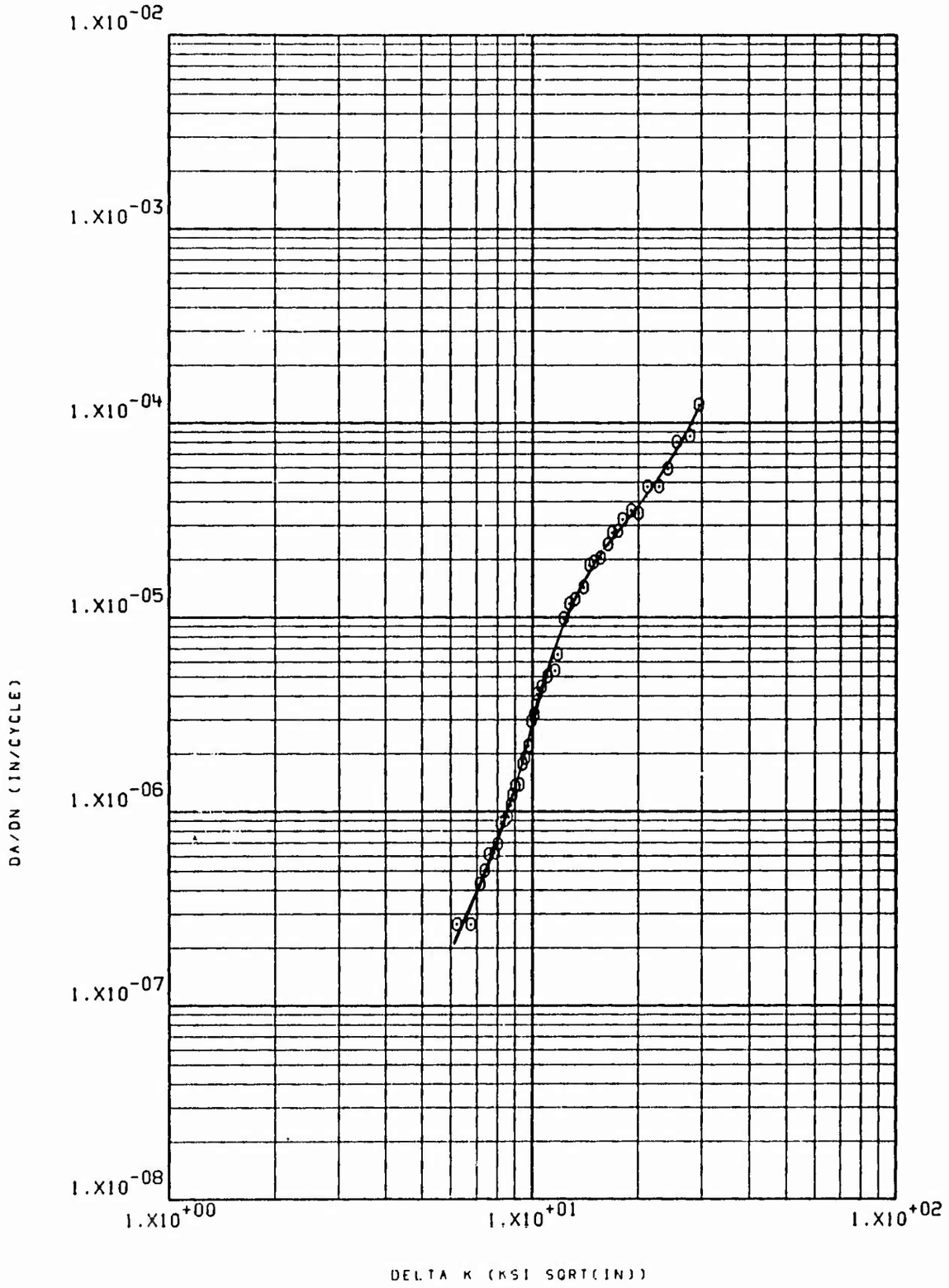

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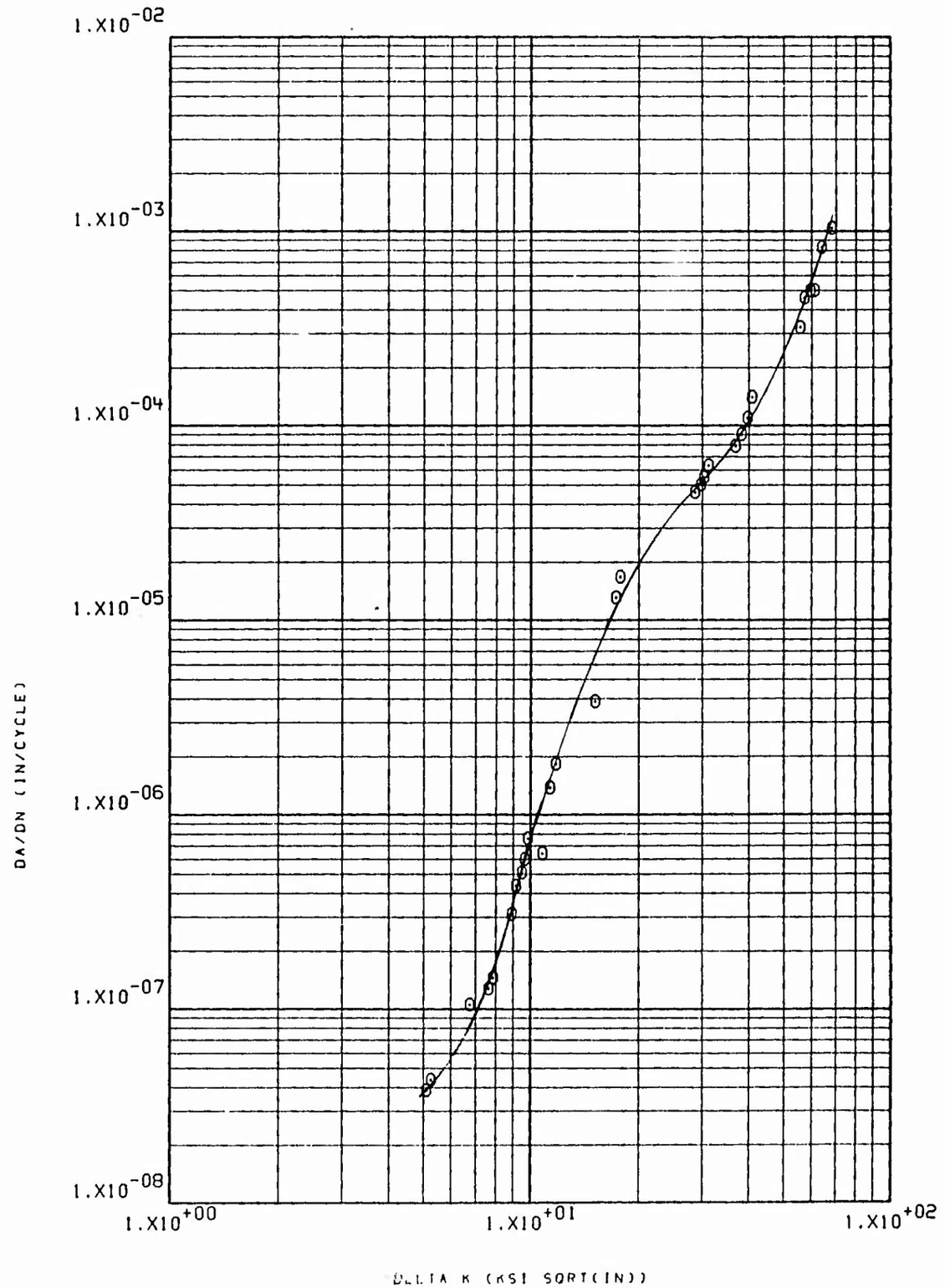

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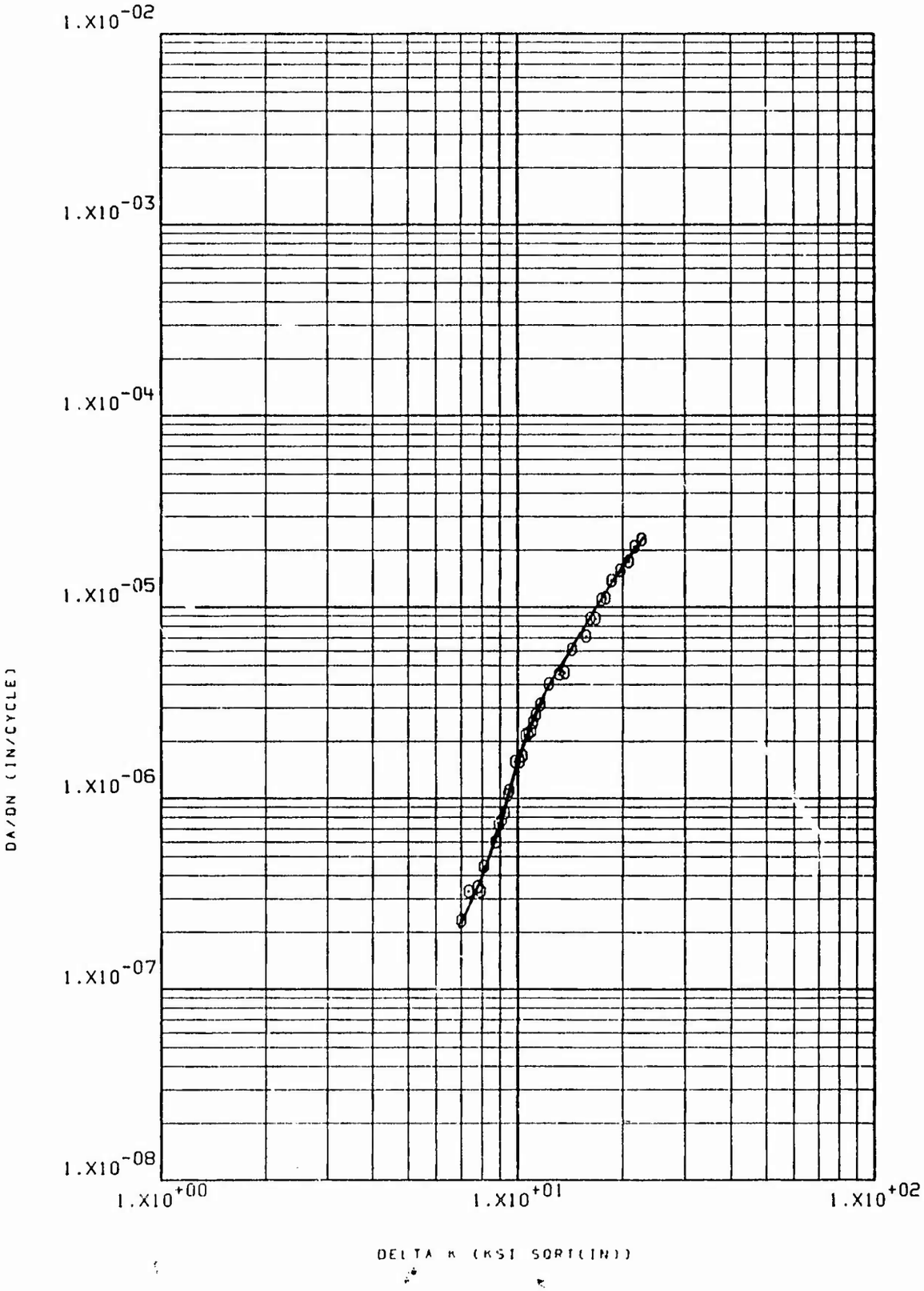

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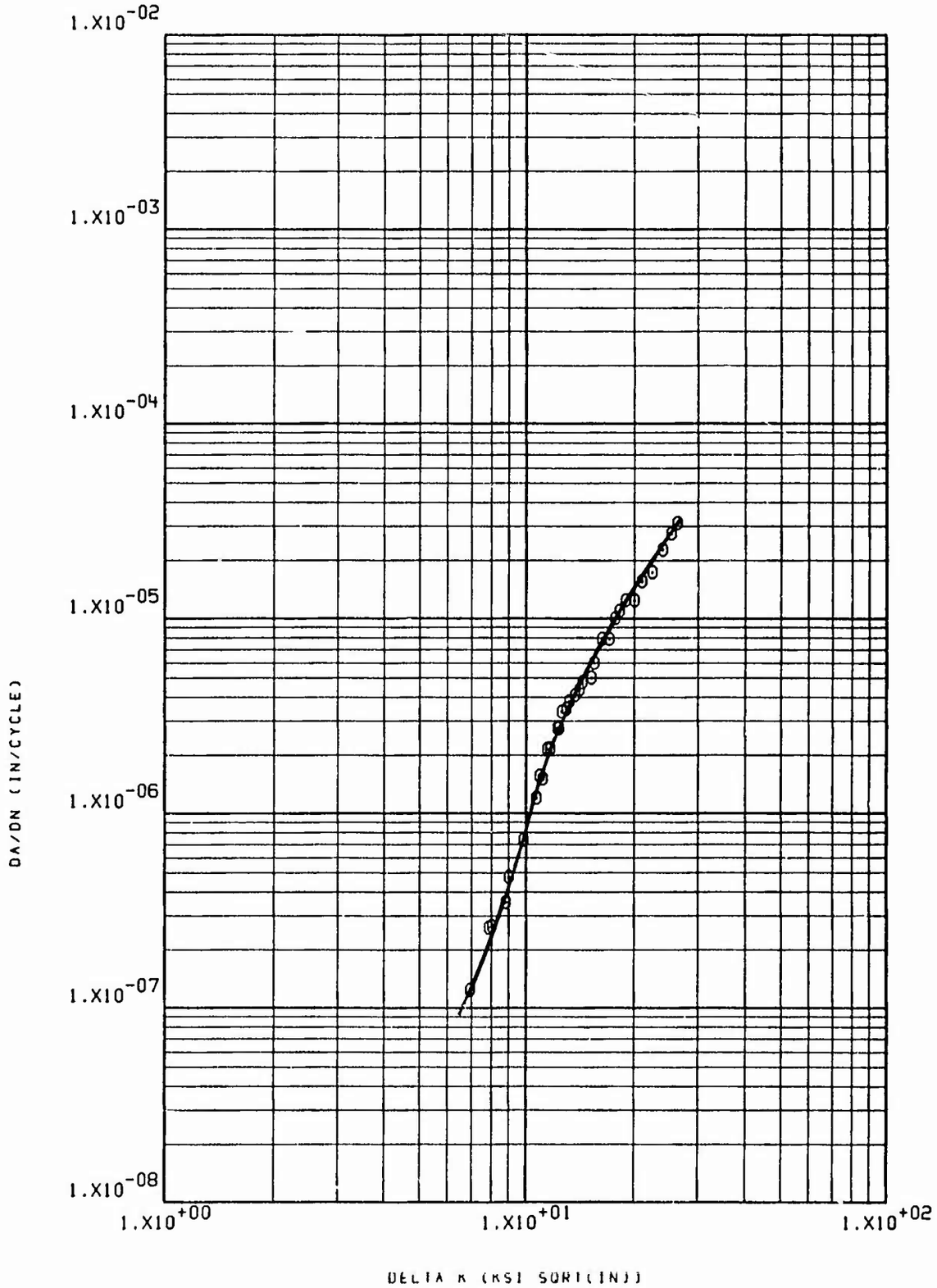

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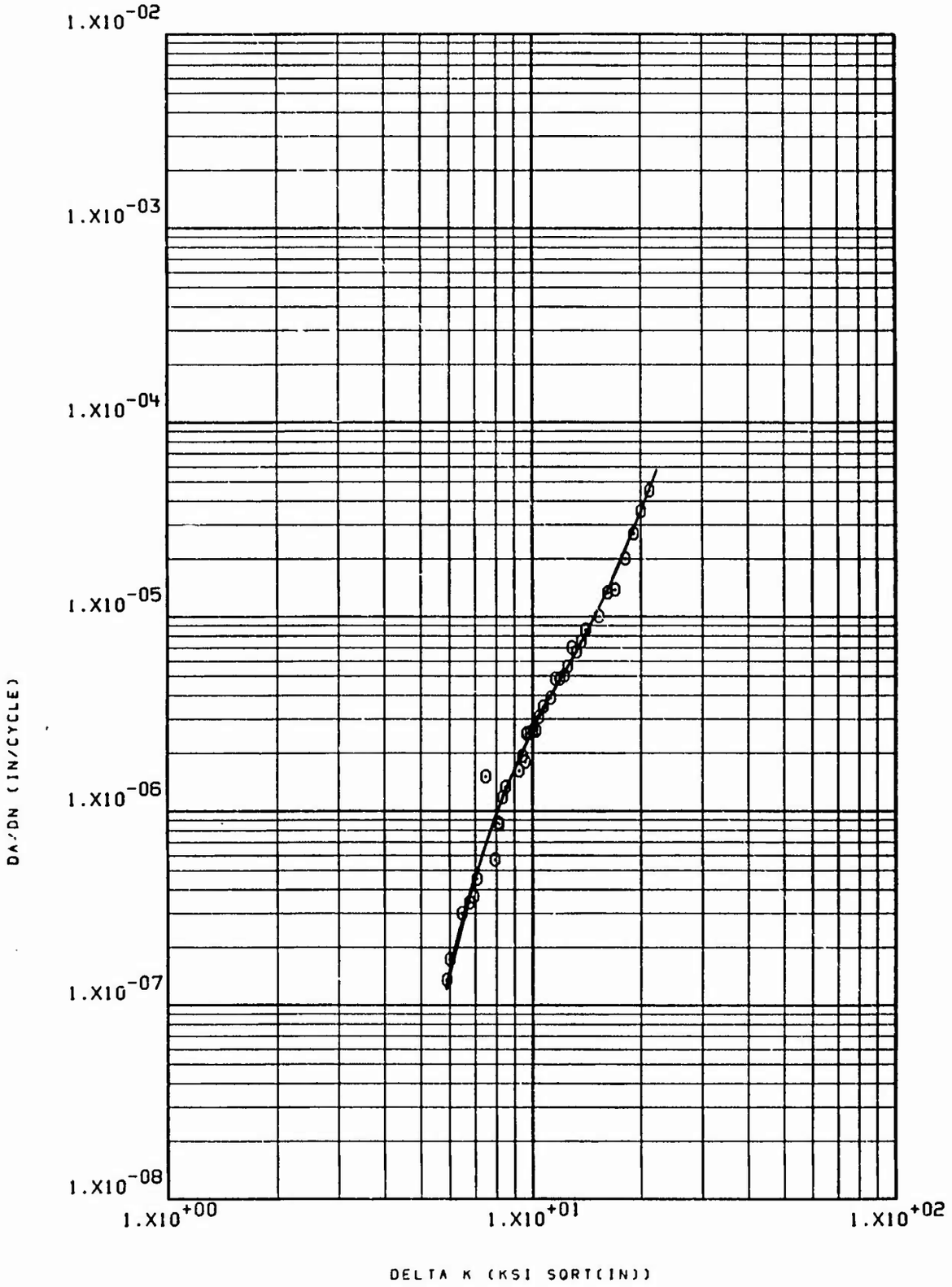

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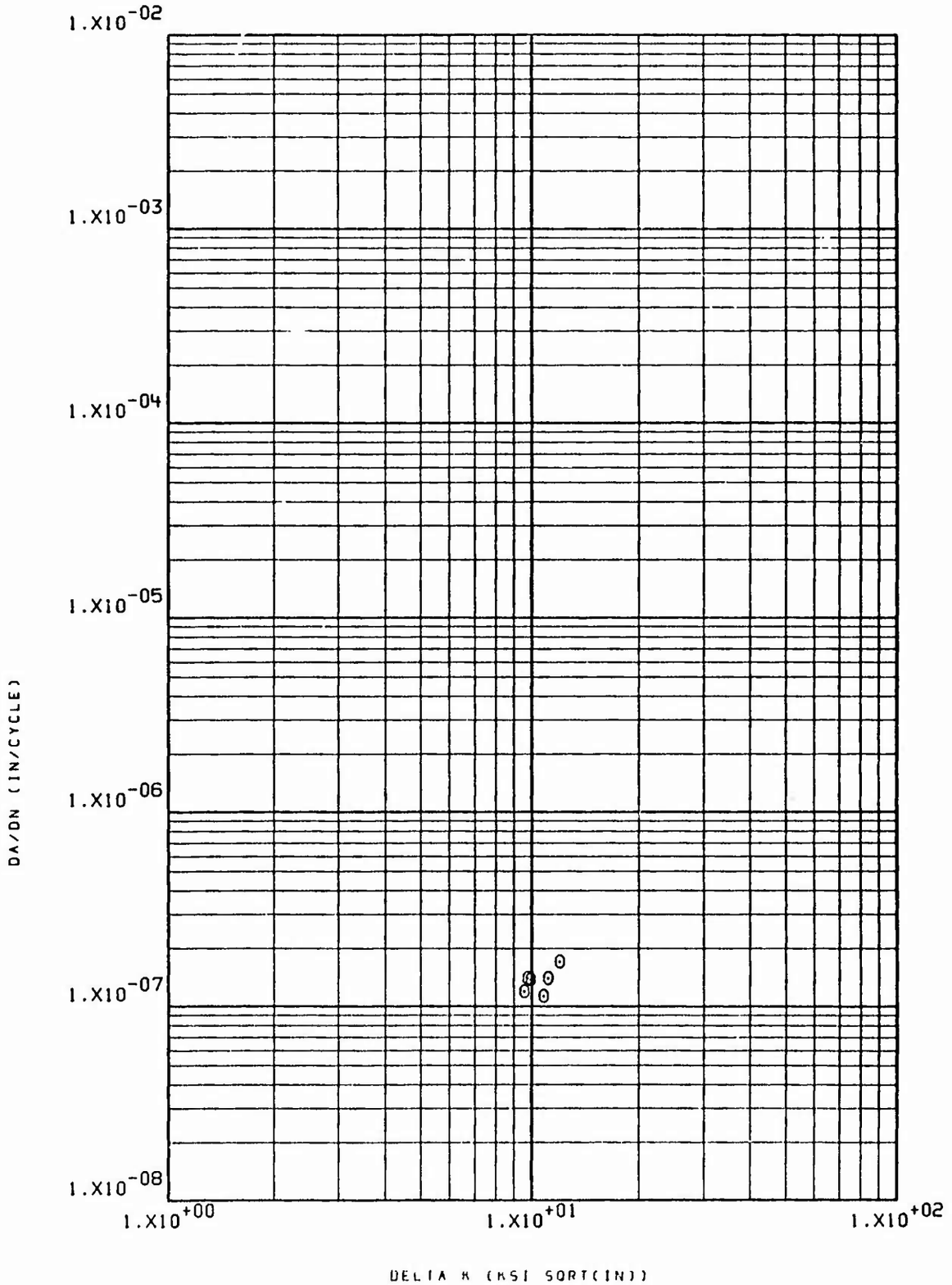

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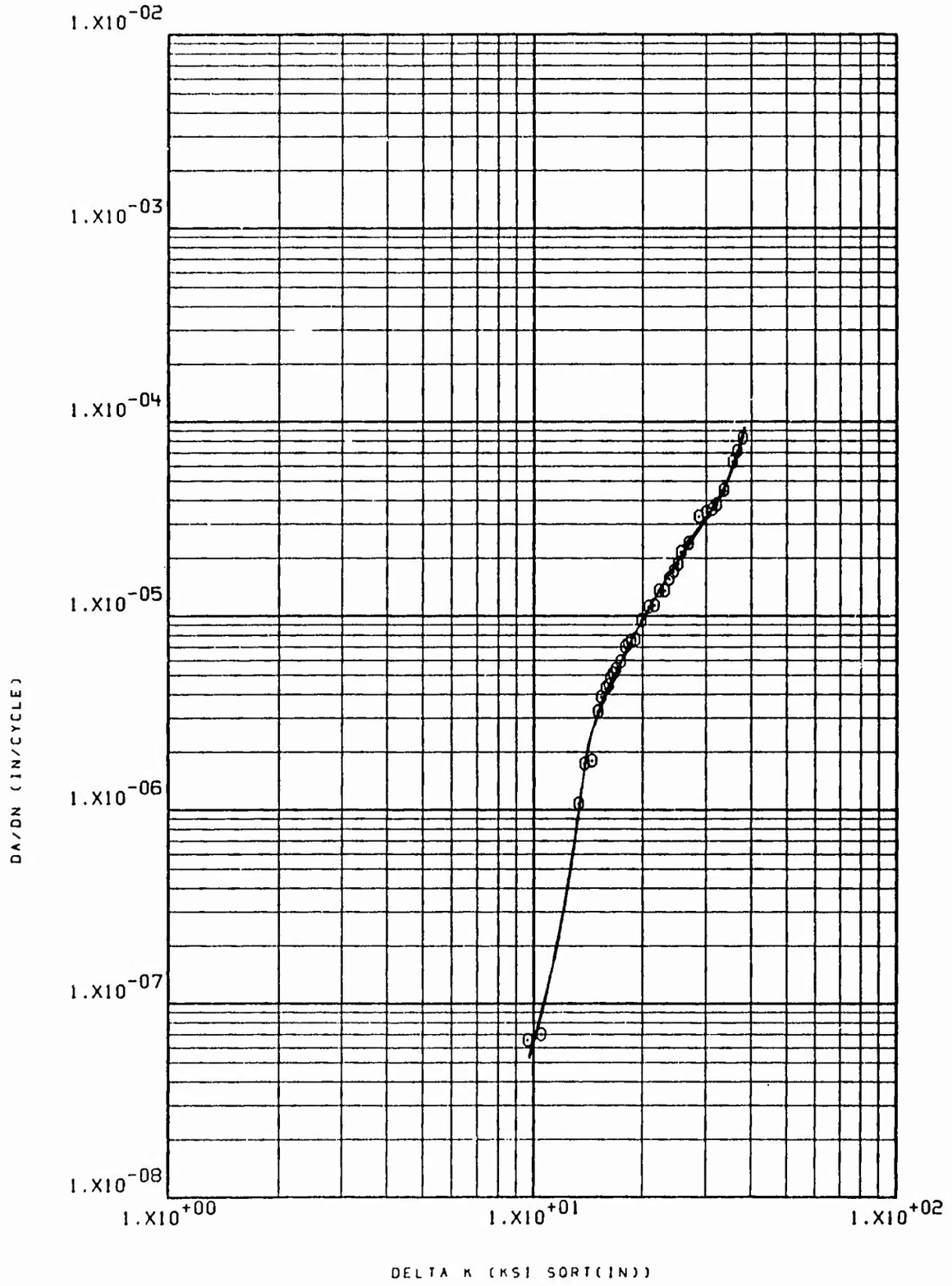

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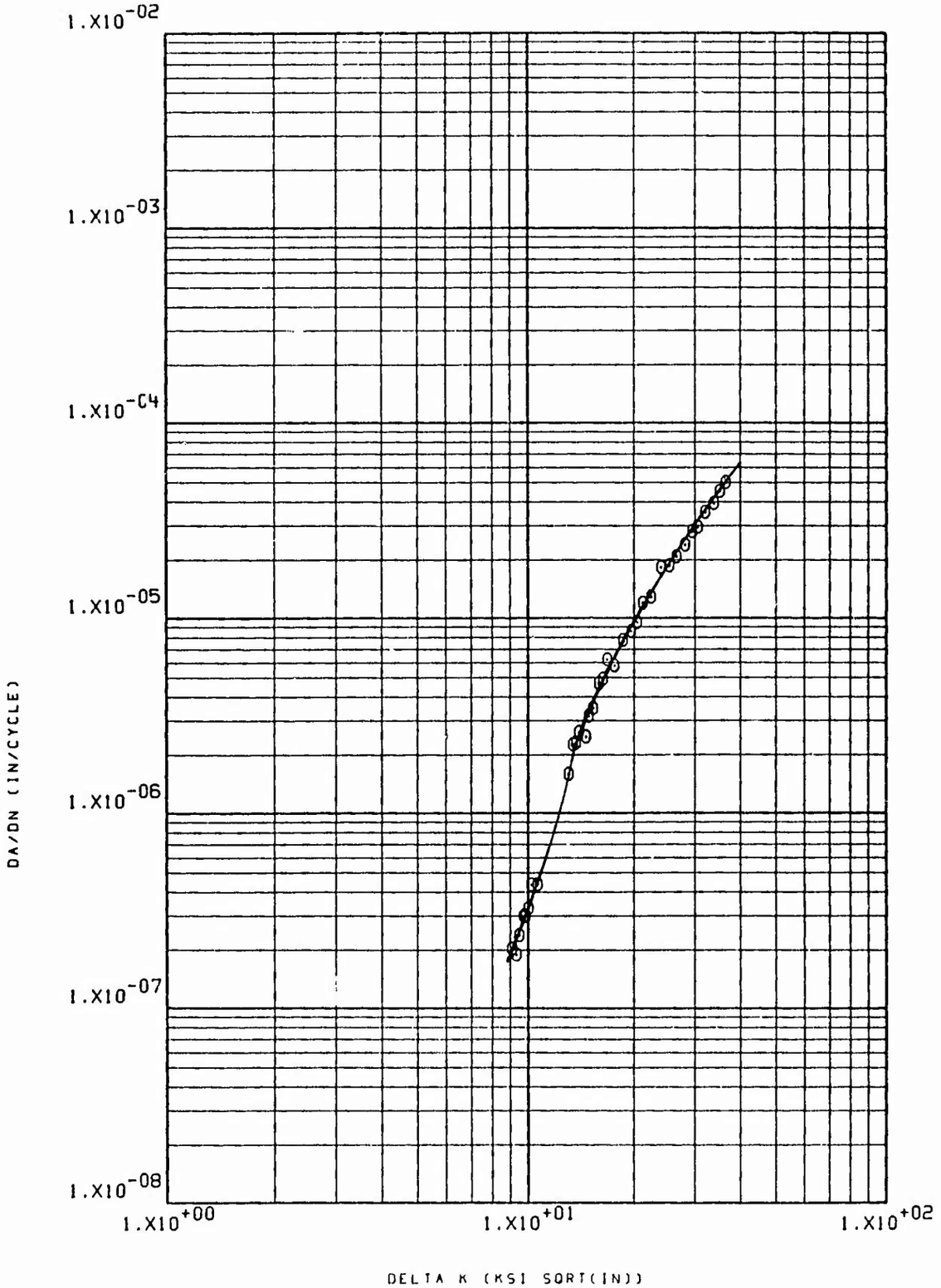

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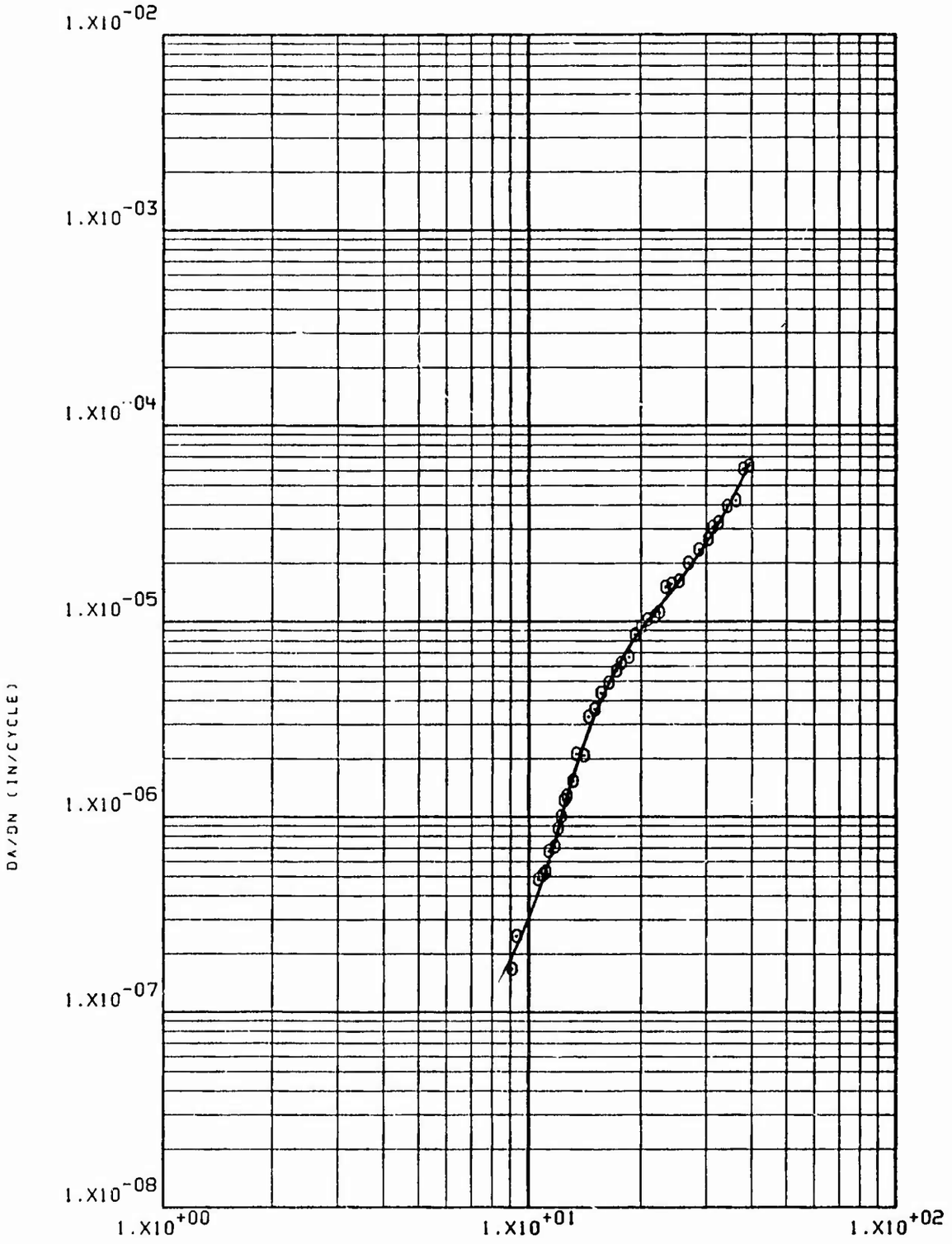

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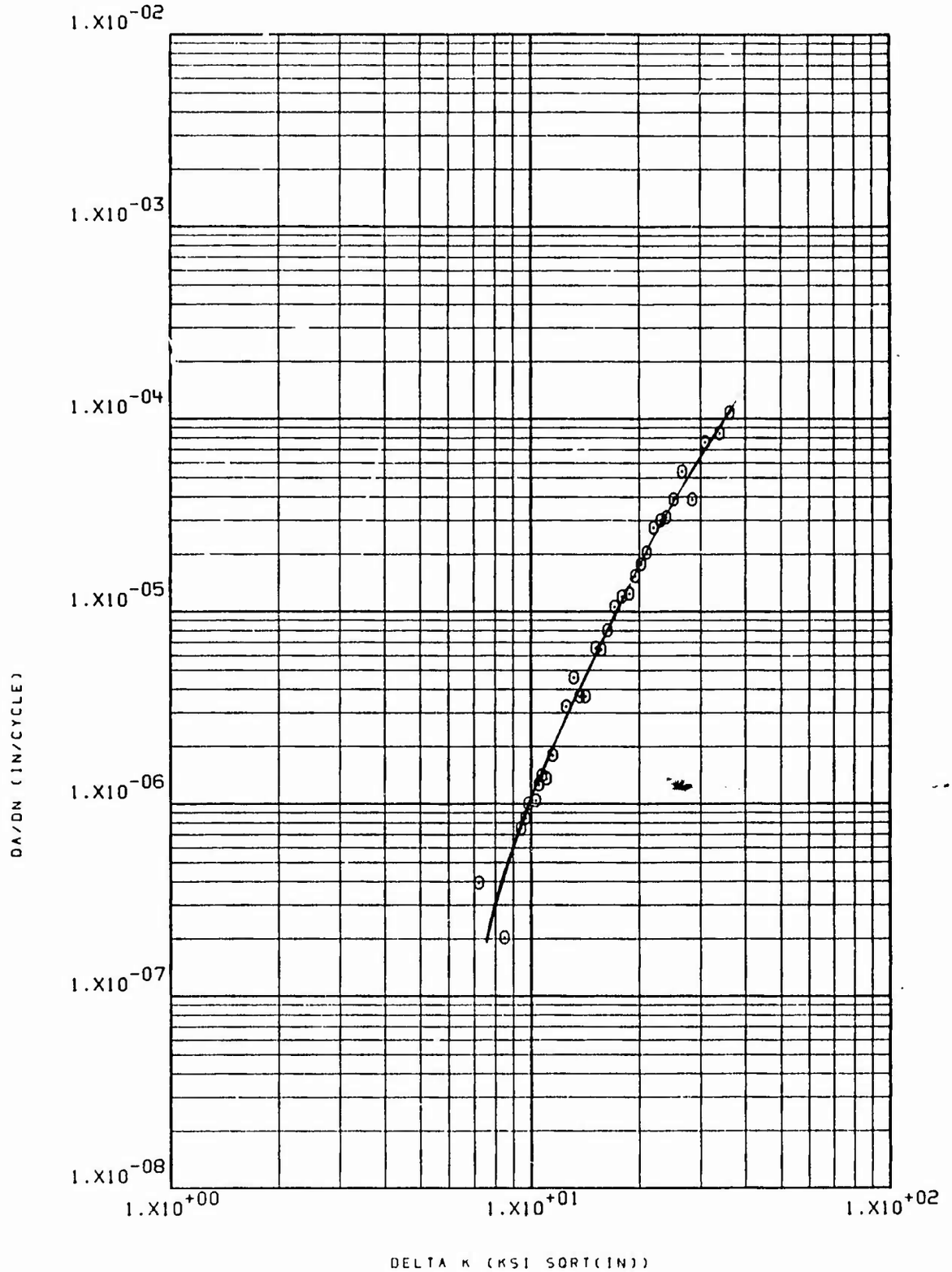
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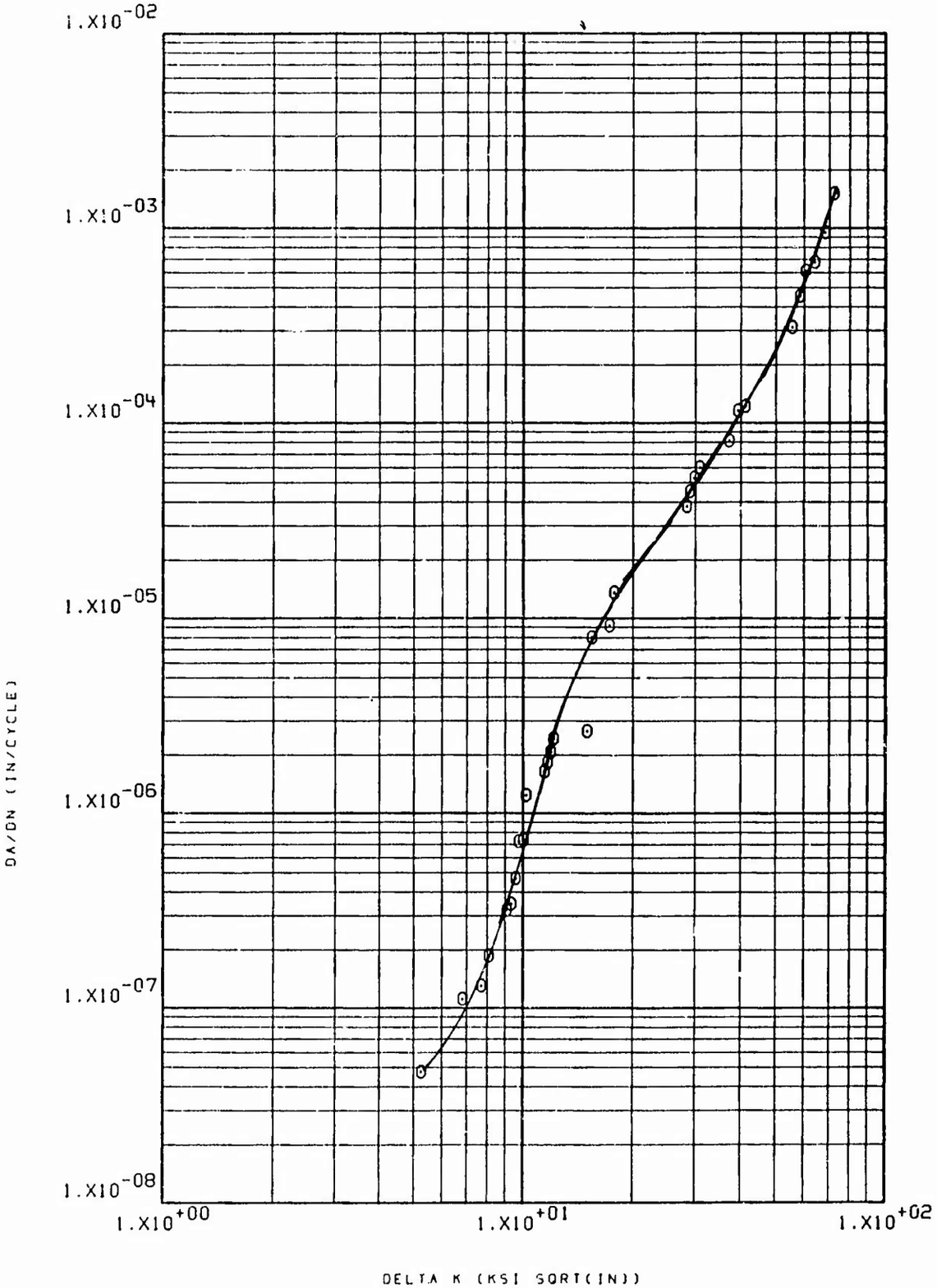
1.X10-08
DA/DN (IN/CYCLE)
1.X10+00
1.X10+01
1.X10+02
DELTA K (KSI SQRT(IN))
72 NAR 46-40 TI 6AL-4V DBTC SUMP RT 6LCPM R=.08



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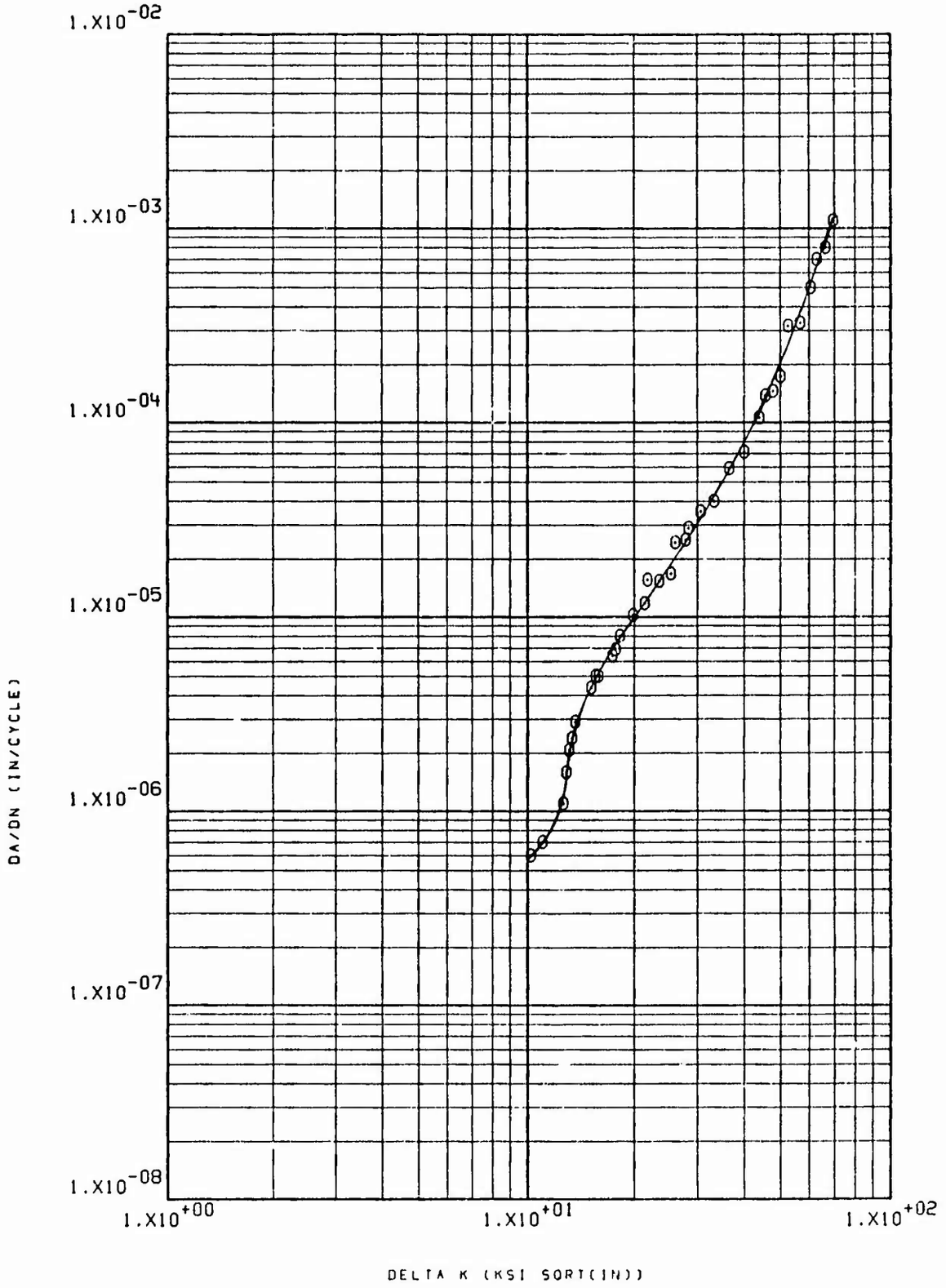

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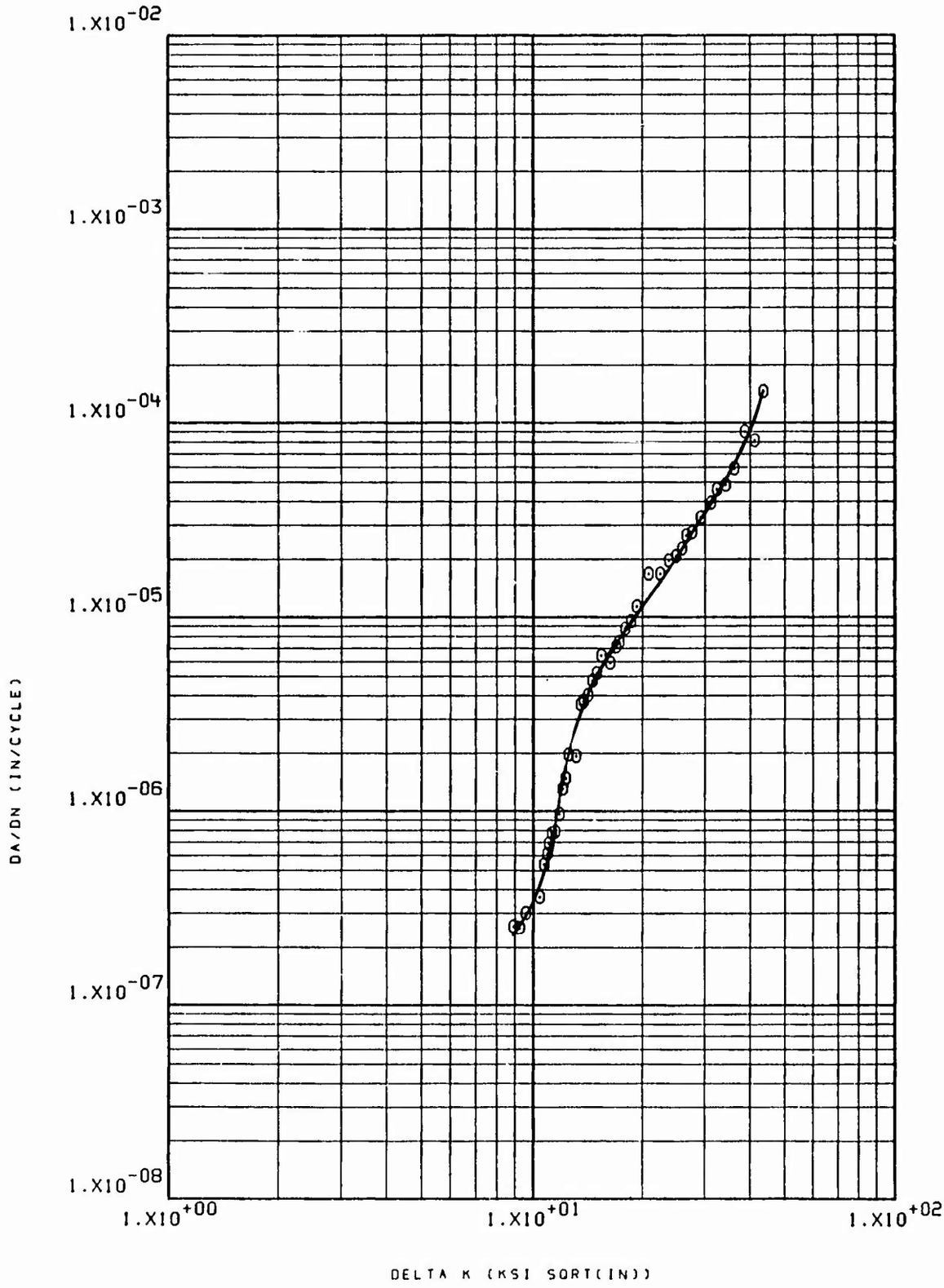

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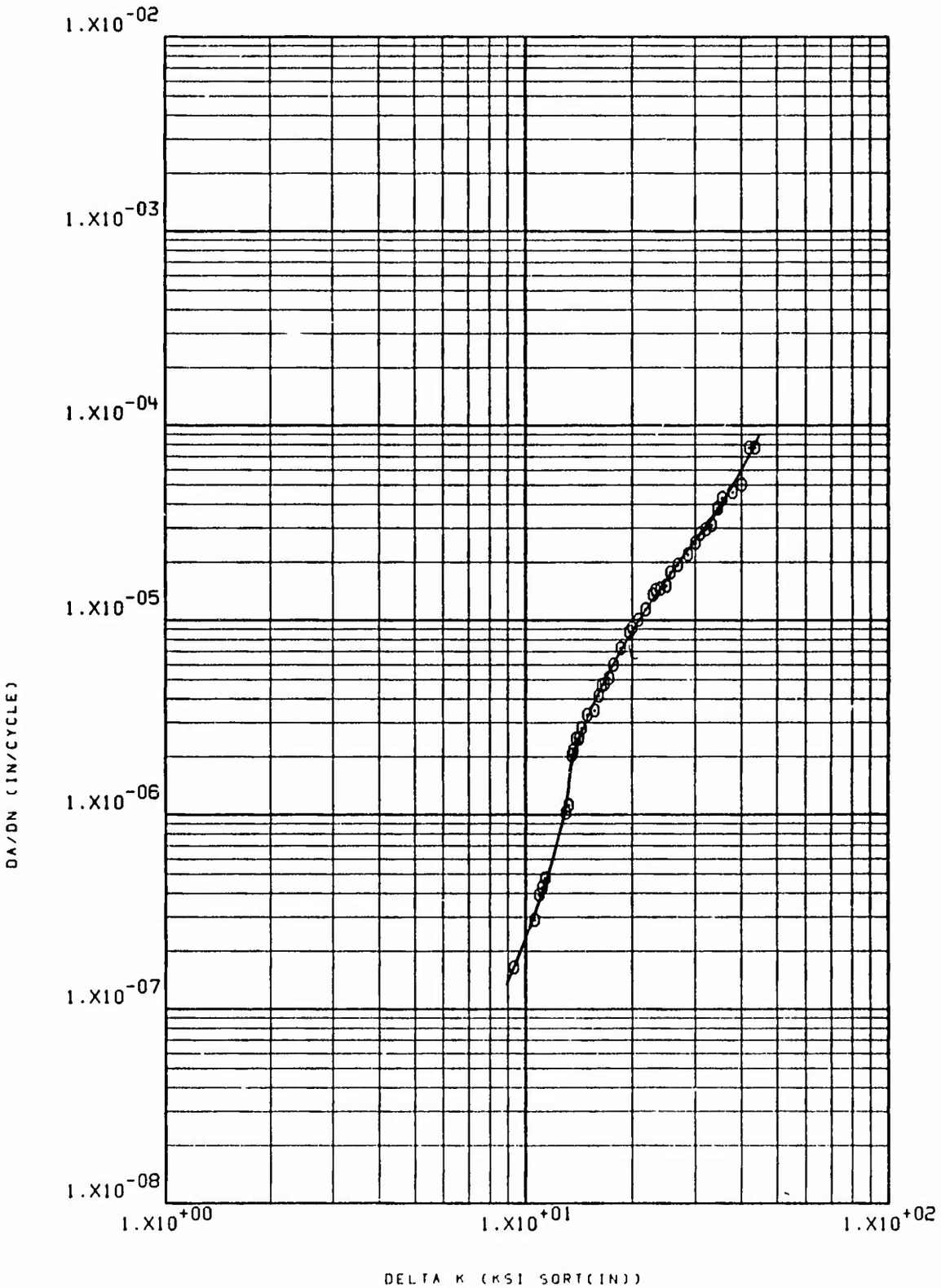
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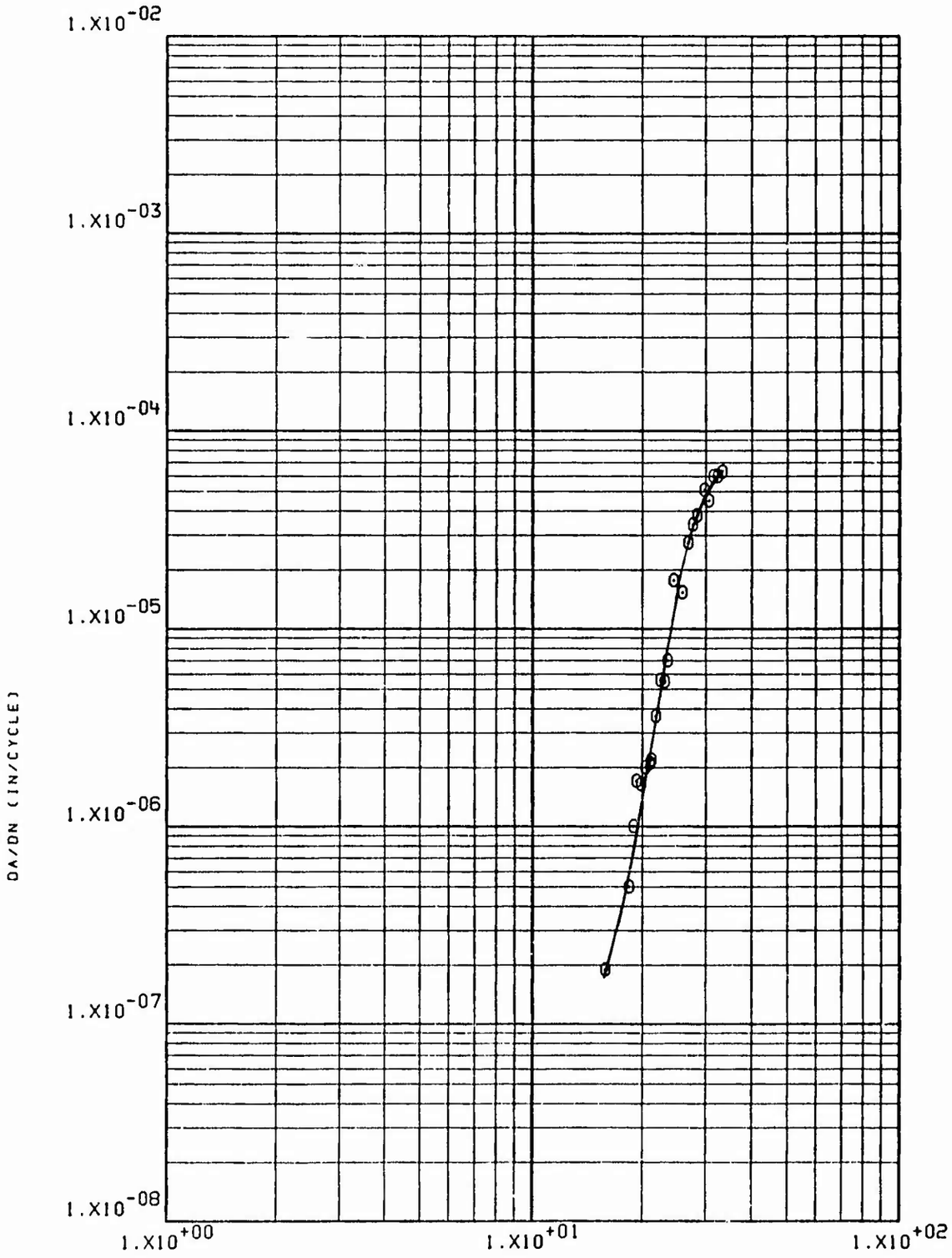
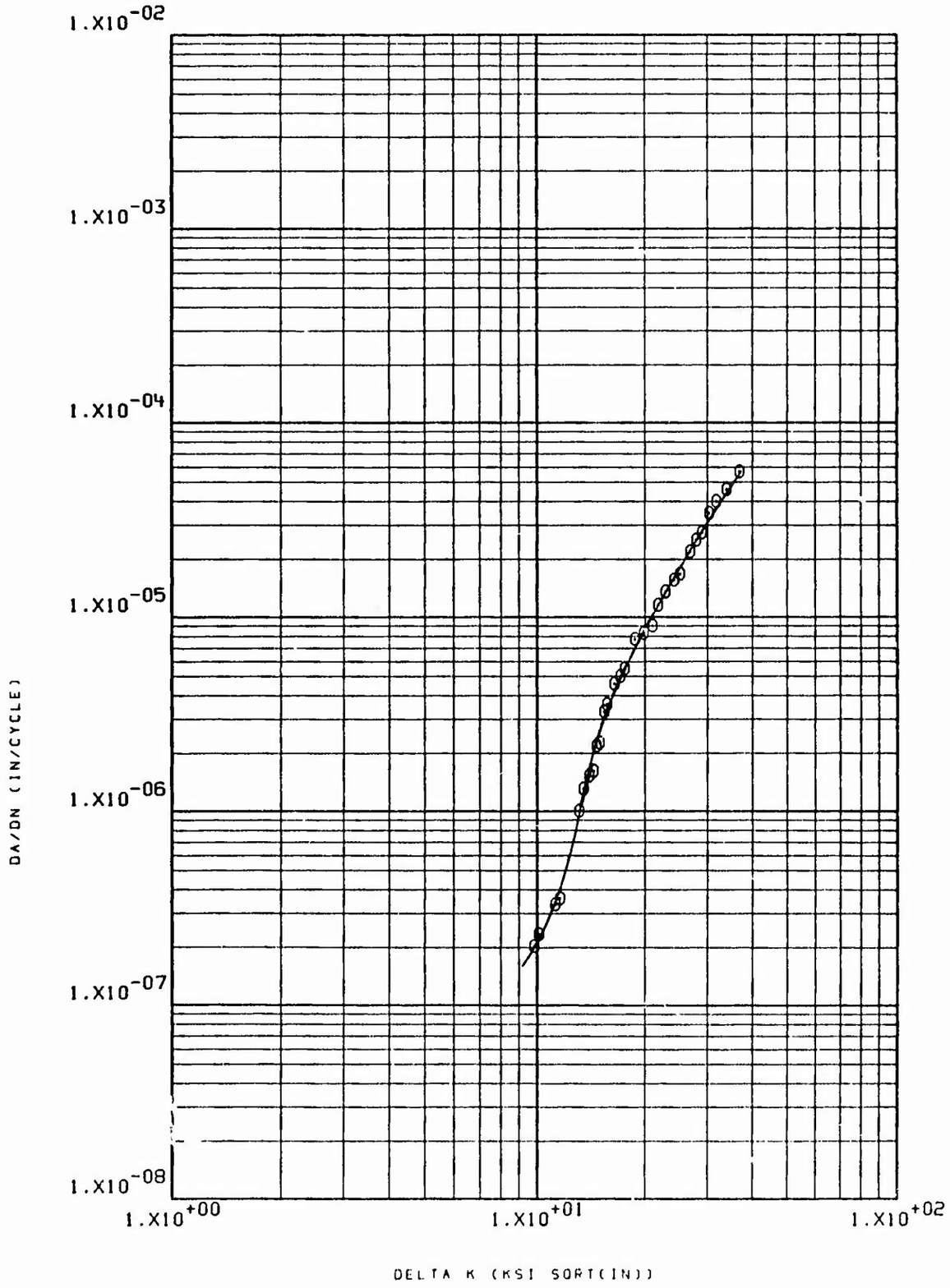
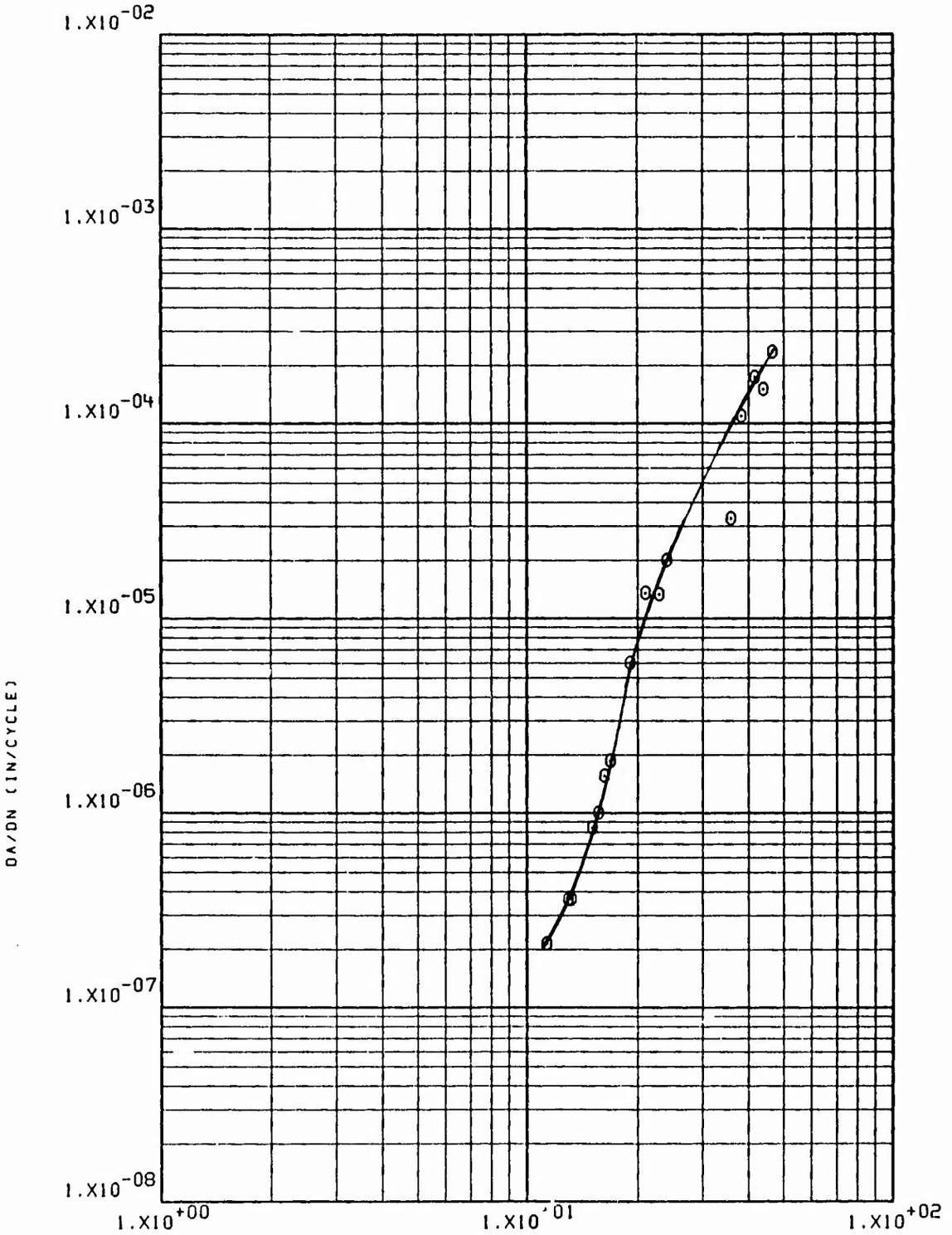
1.X10-07
1.X10-08
DA/DN (IN/CYCLE)
1.X10+00
1.X10+01
1.X10+02
DELTA K (KSI SQRT(IN))
72 NWR 46 44 TI 6AL-4V RA LHA RT 360CPM R=.08

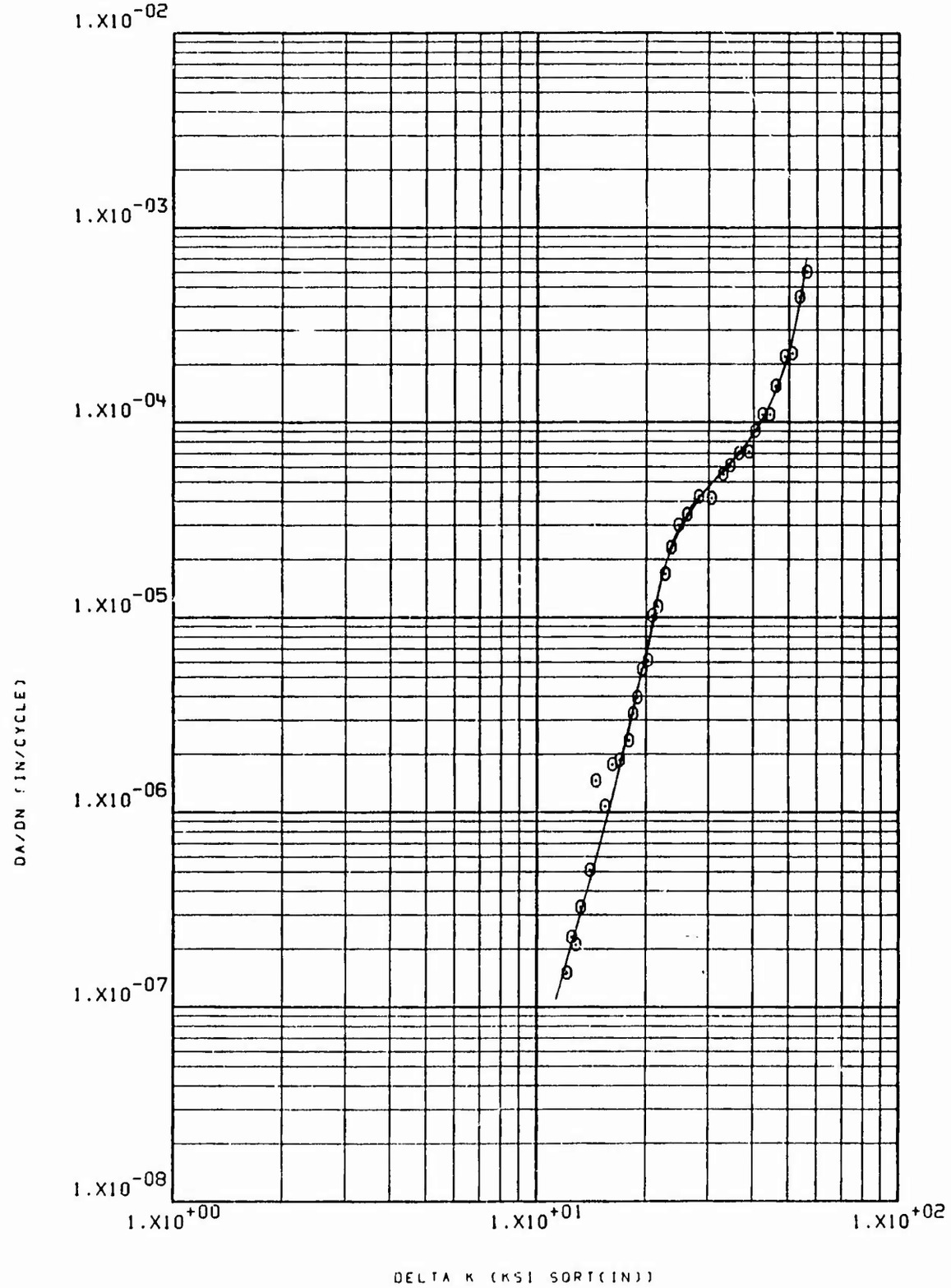


72 NPW 46-73 TI 6AL-4V RA STW RT R=.08 60CPM

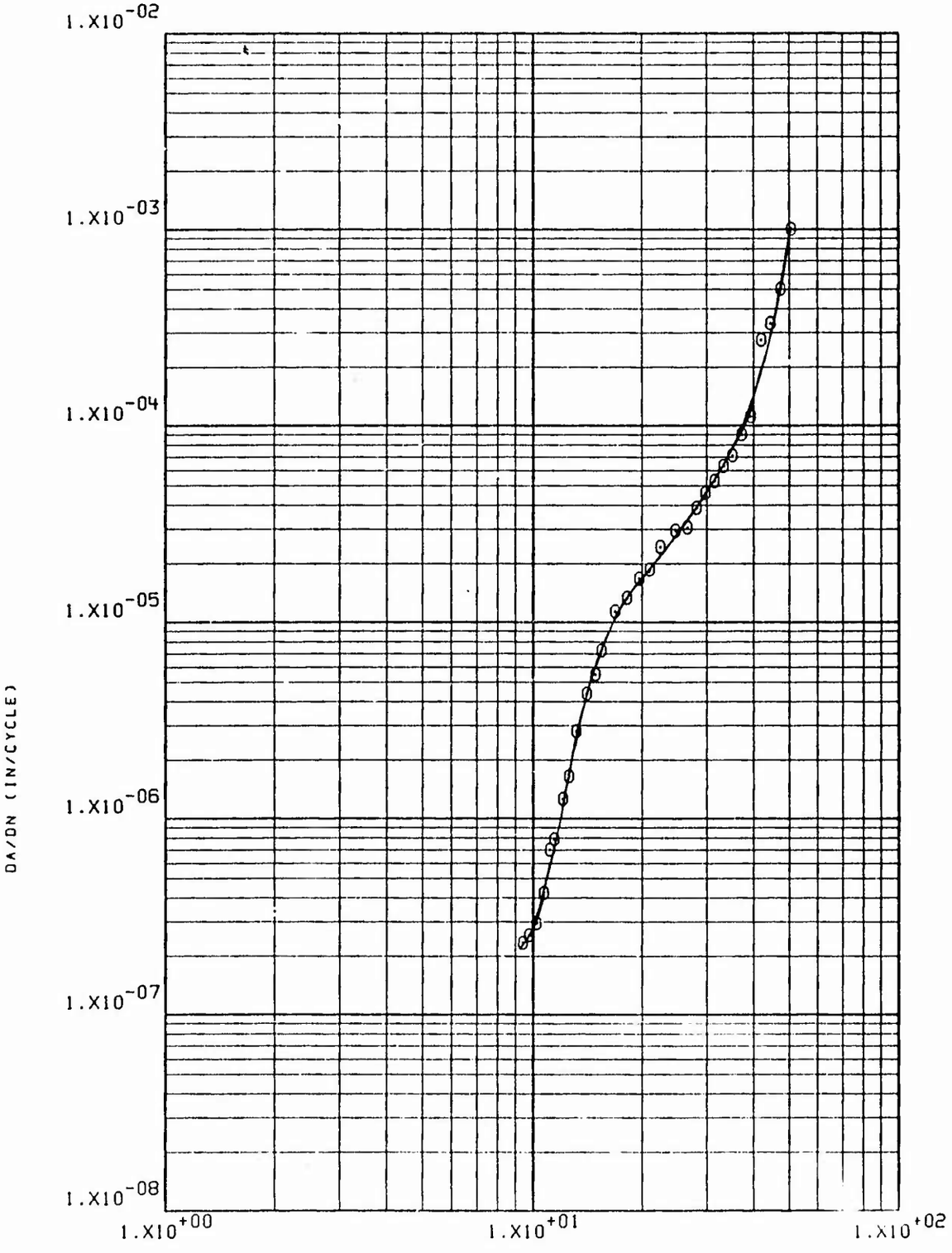

1.X10-02
1.X10-03
1.X10-04
1.X10-05
1.X10-06
1.X10-07
1.X10-08
DA/DN (IN/CYCLE)
1.X10+00
1.X10+01
1.X10+02
DELTA K (KSI SQRT(IN))
74 'UTw/Tw 52-1 TI-6AL-4V DB
LHA
RT 3600PM R=.08



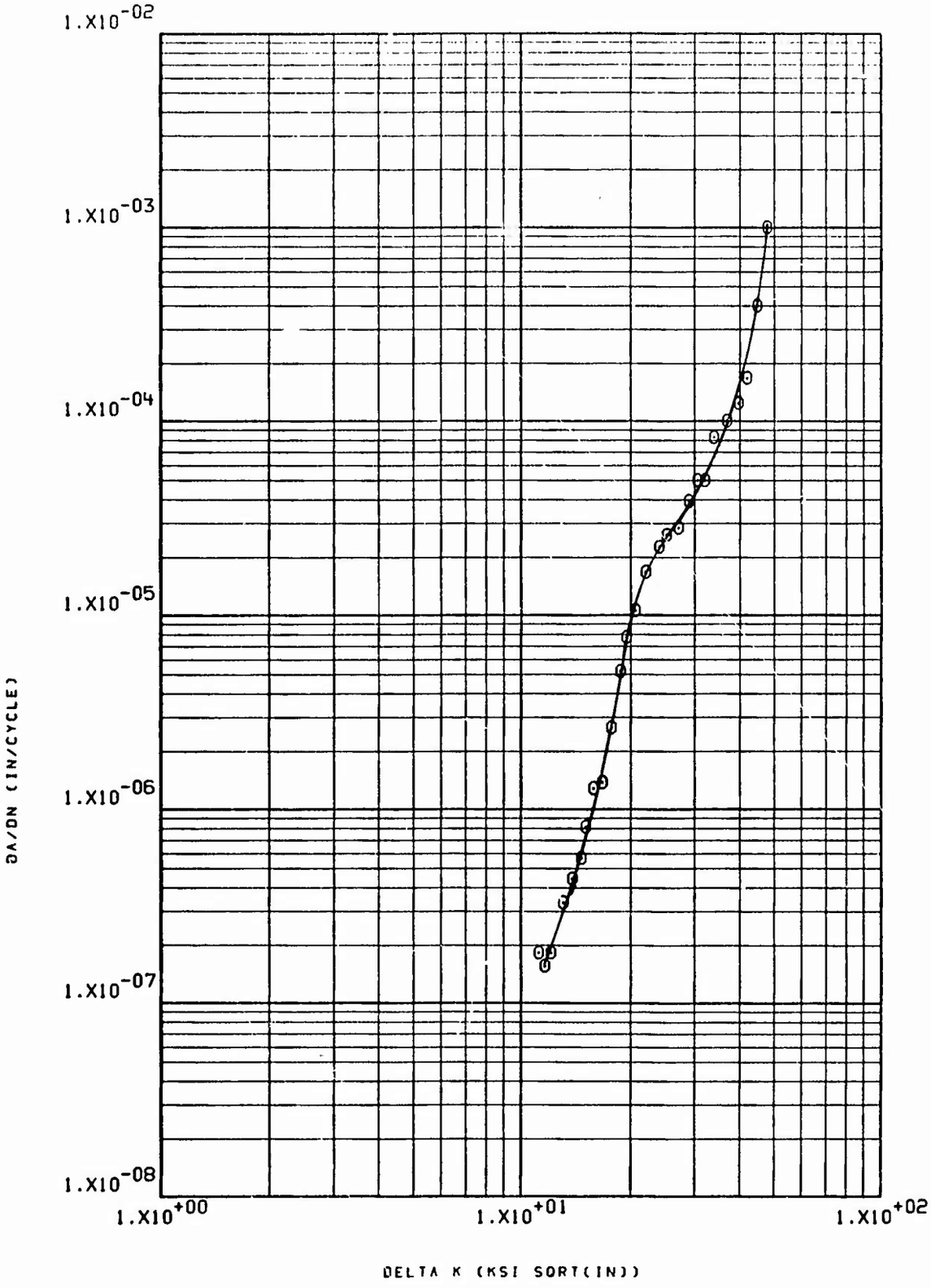
74 NTW 52-2 TI-6AL-4V DB STW RT R=.08 60CPM



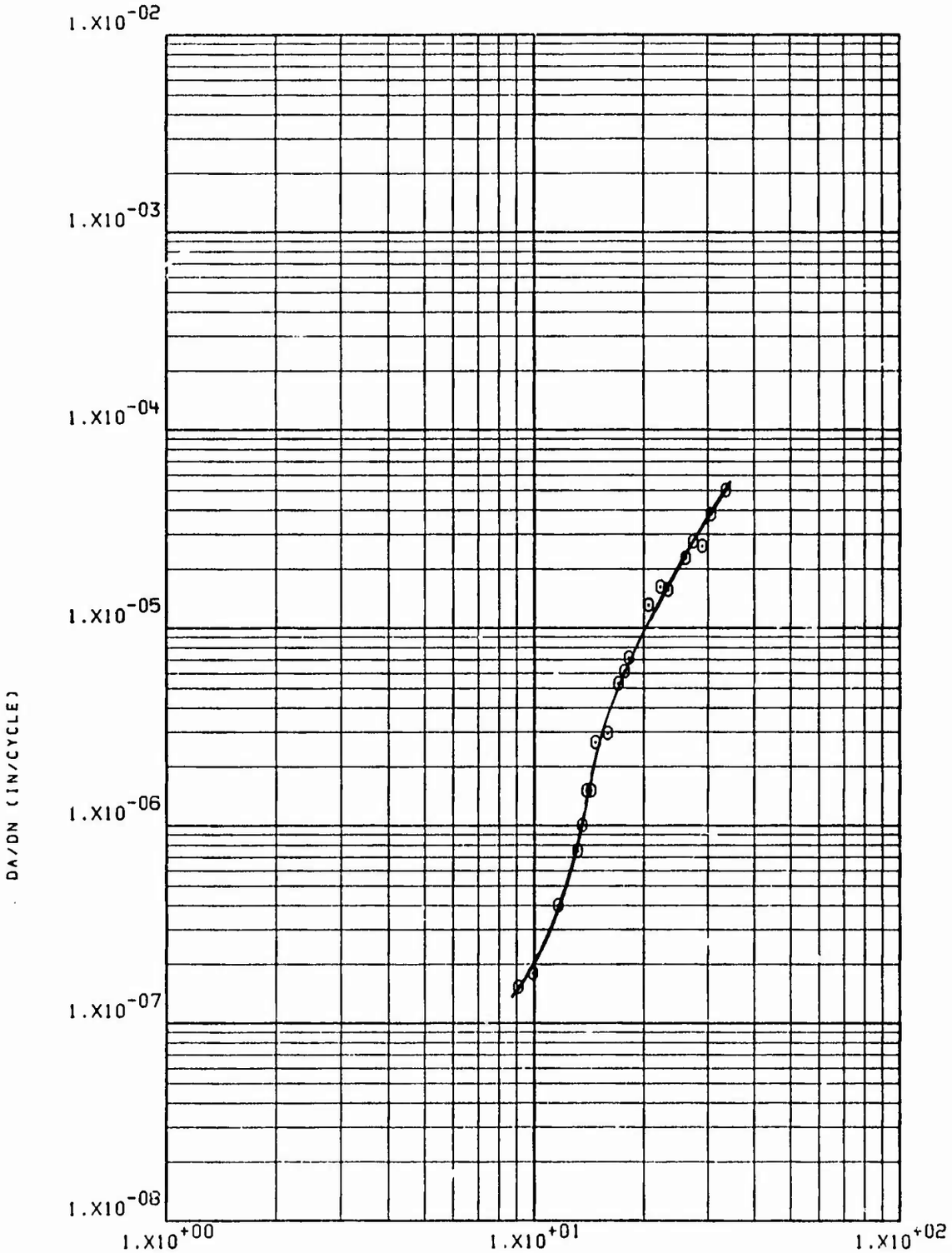
74 NWP 52-3 TI-6AL-4V DB SUMP RT 60CPM R=.08



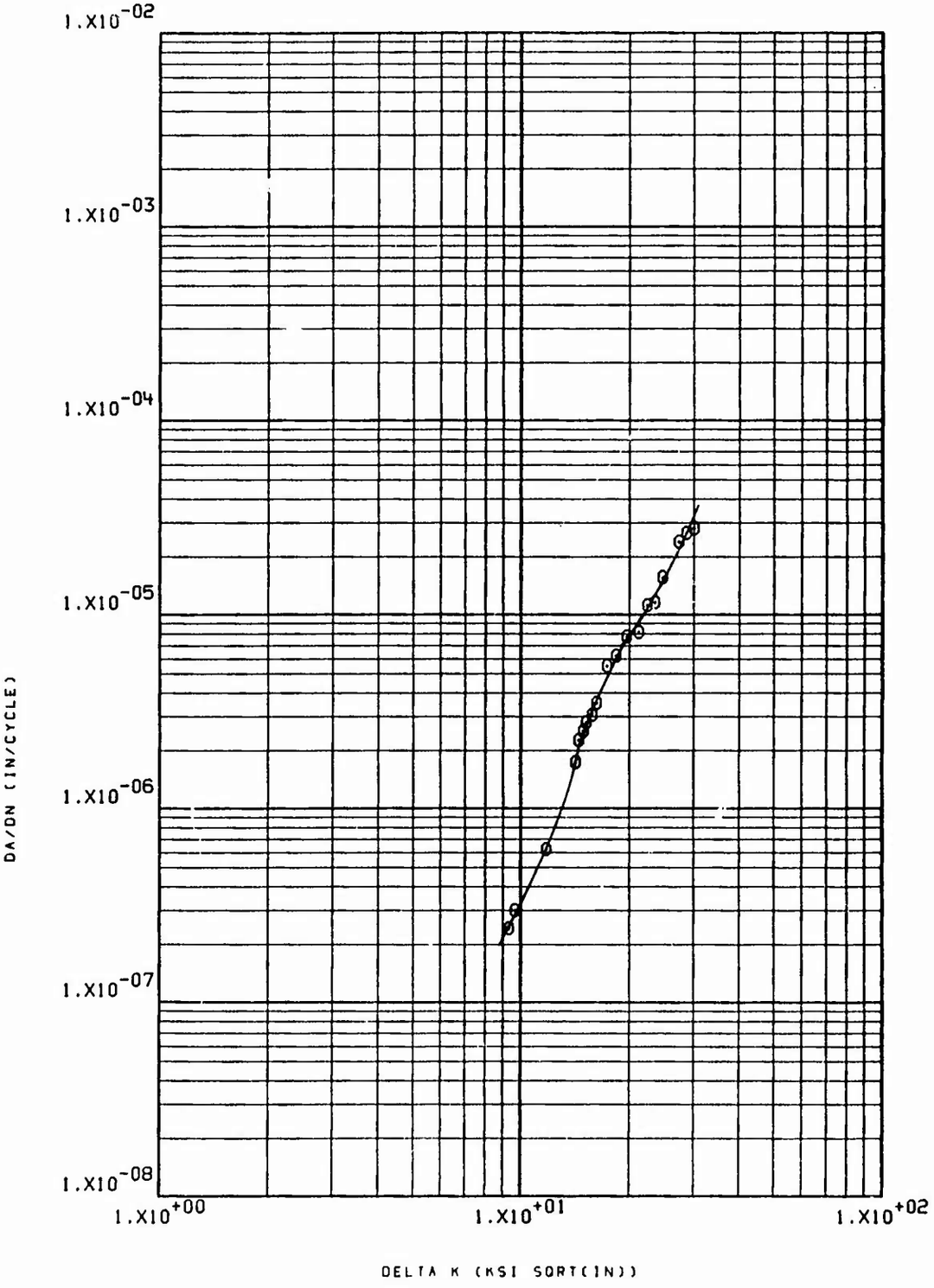
74 MT#/TM 52-20 TI-6AL 4V DB SUMP RT 60CPM R=.08



74 NTW 52-21 TI-6AL-4V DB + TR STW RT R=0.08 60CPM



74 NWP 52-22 TI-6AL-4V DB LHA RT R=.08 360CPM



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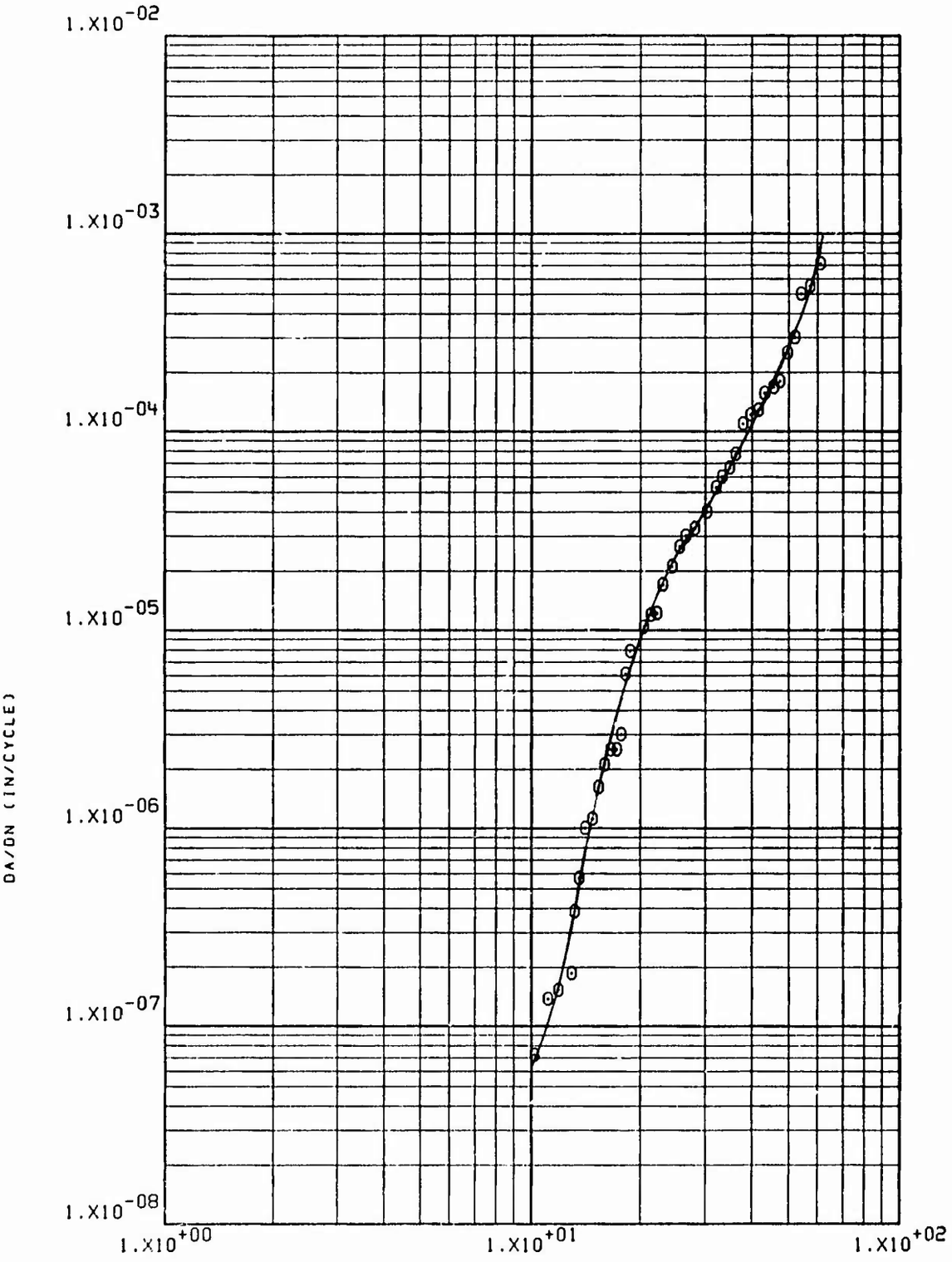
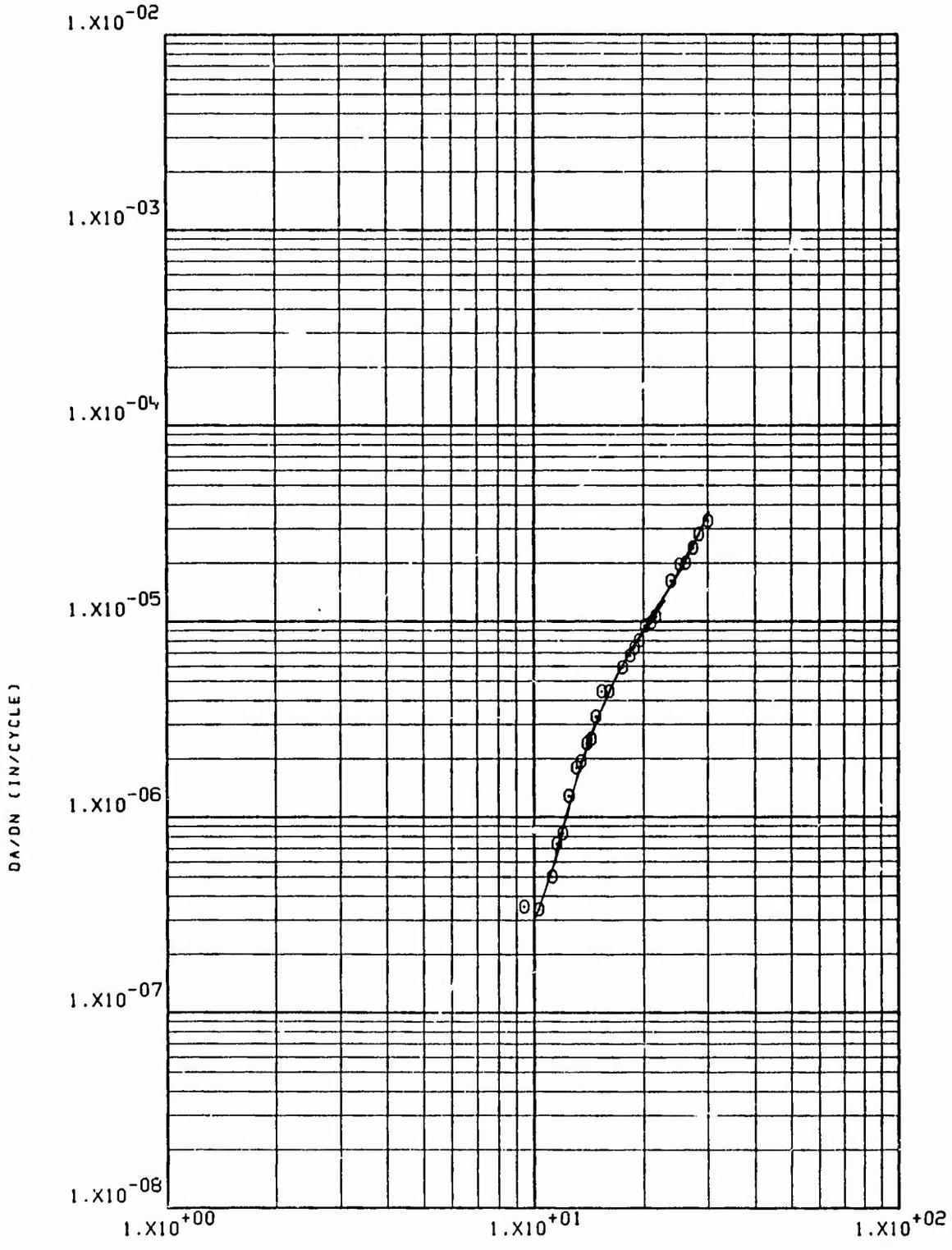
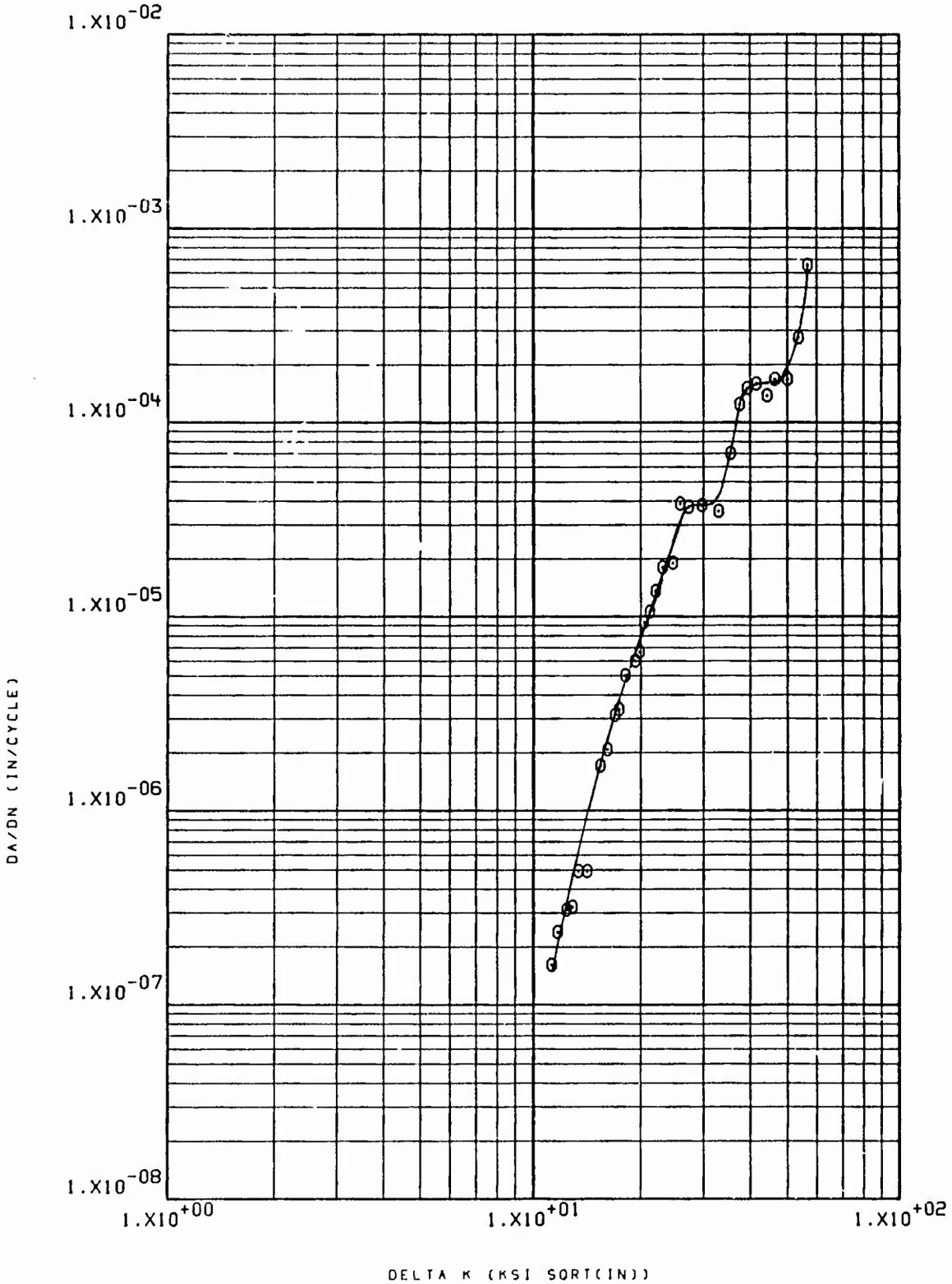


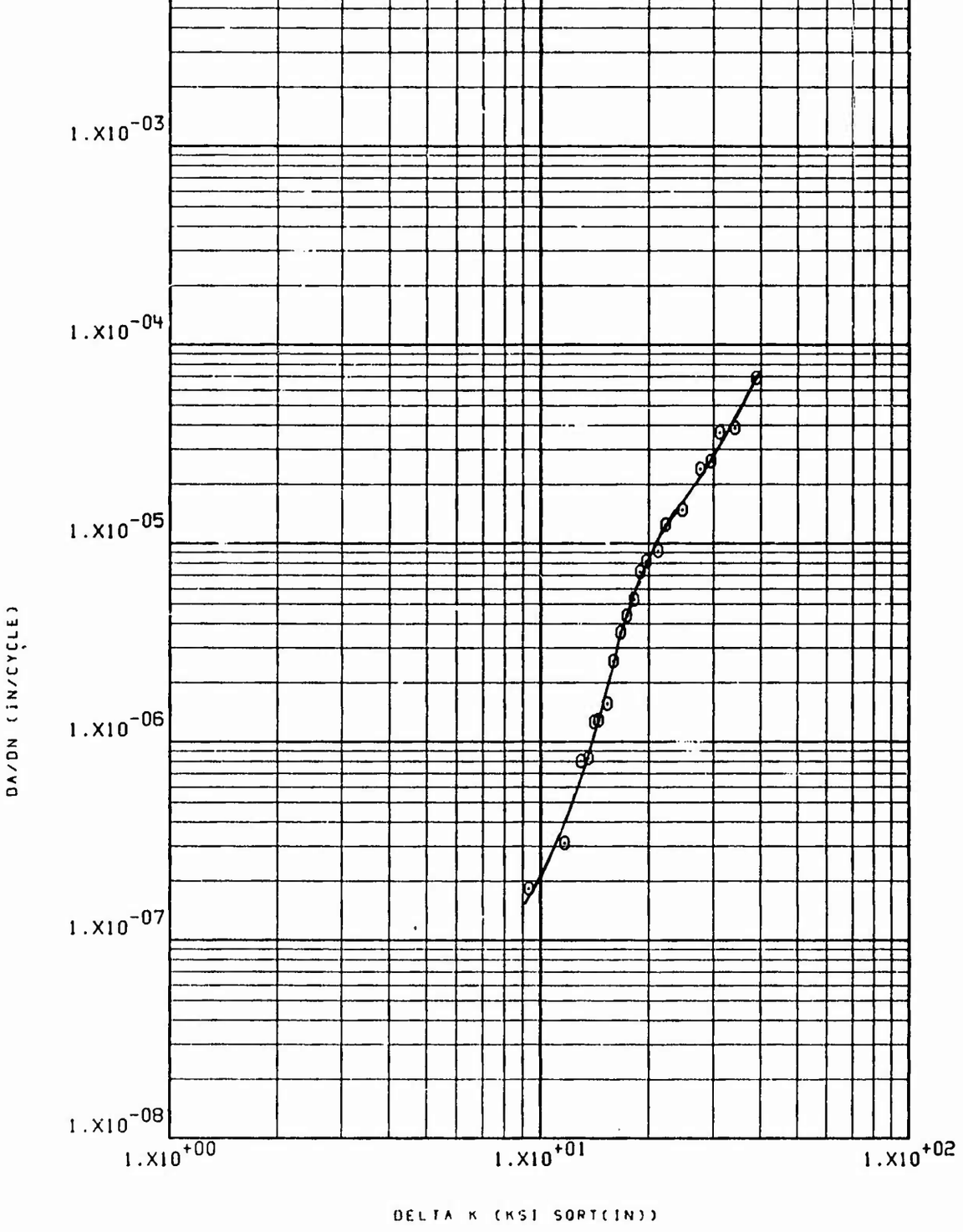
74 NAR 53-3 TI-6AL-4V DB + 2DBTC SUMP RT 60CPM R=.08



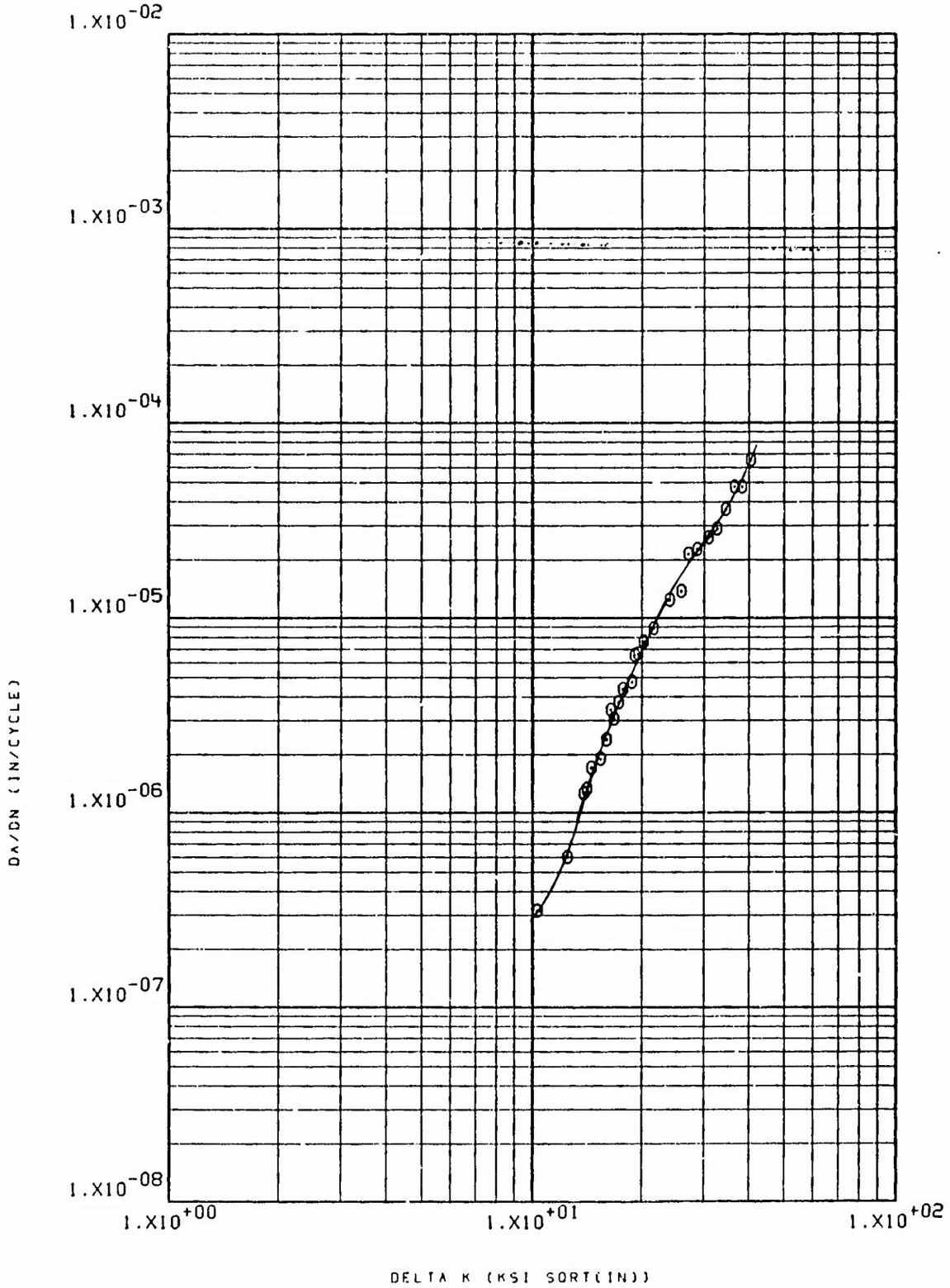
74 NTW/TW 54-1 TI-6AL-4V DB + 4DBTC LHA RT 360CPM R=.08



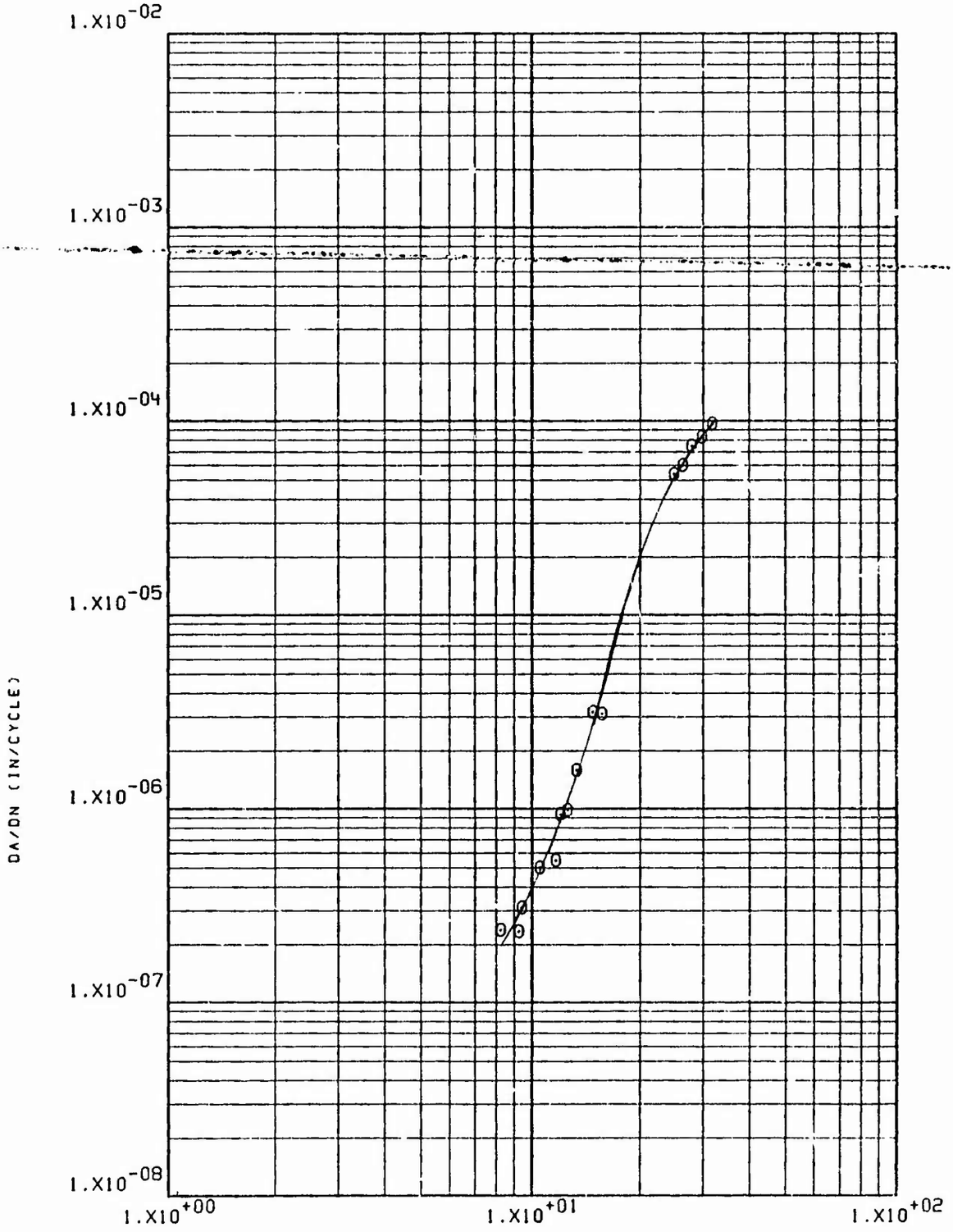
74 NWP 54-3 TI-6AL-4V DB + 4DBTC RT SUMP 60CPM R=.08



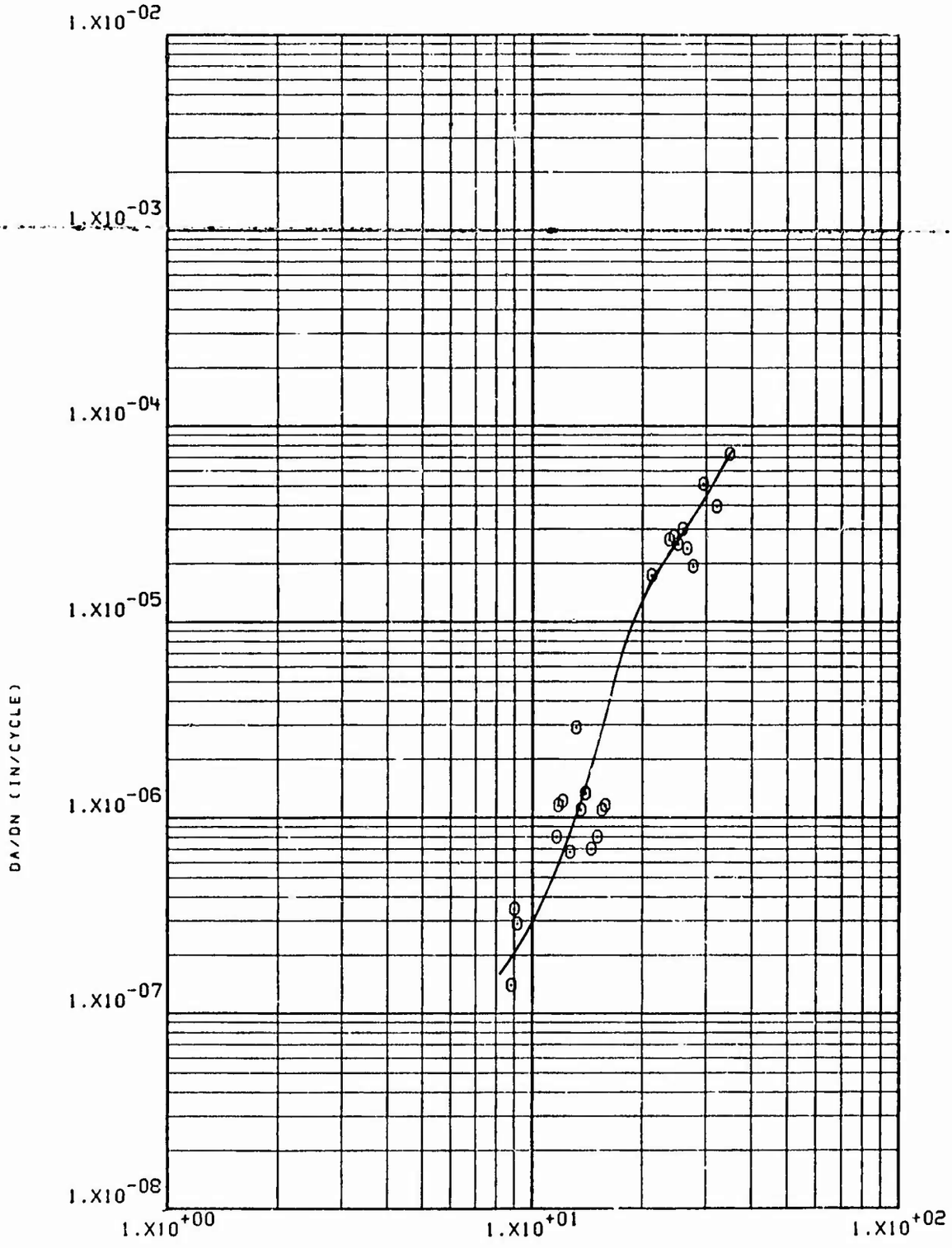
75 NPS 50-1 TI-6AL-4V MA LHA R=.08 RT 3600CPM



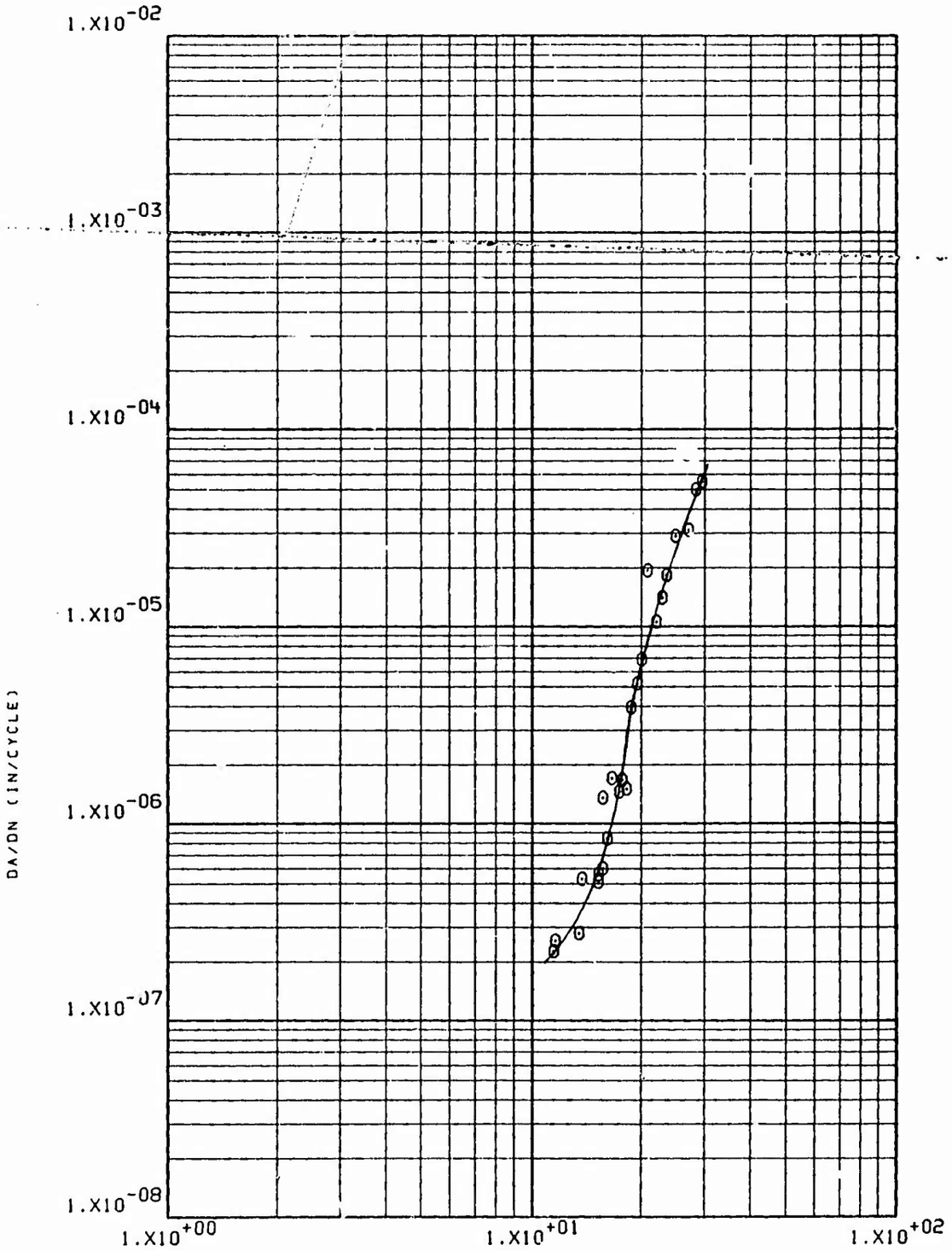
76 NRW 61-16 TI 6AL 4V RA LHA RT 1800PM R=08



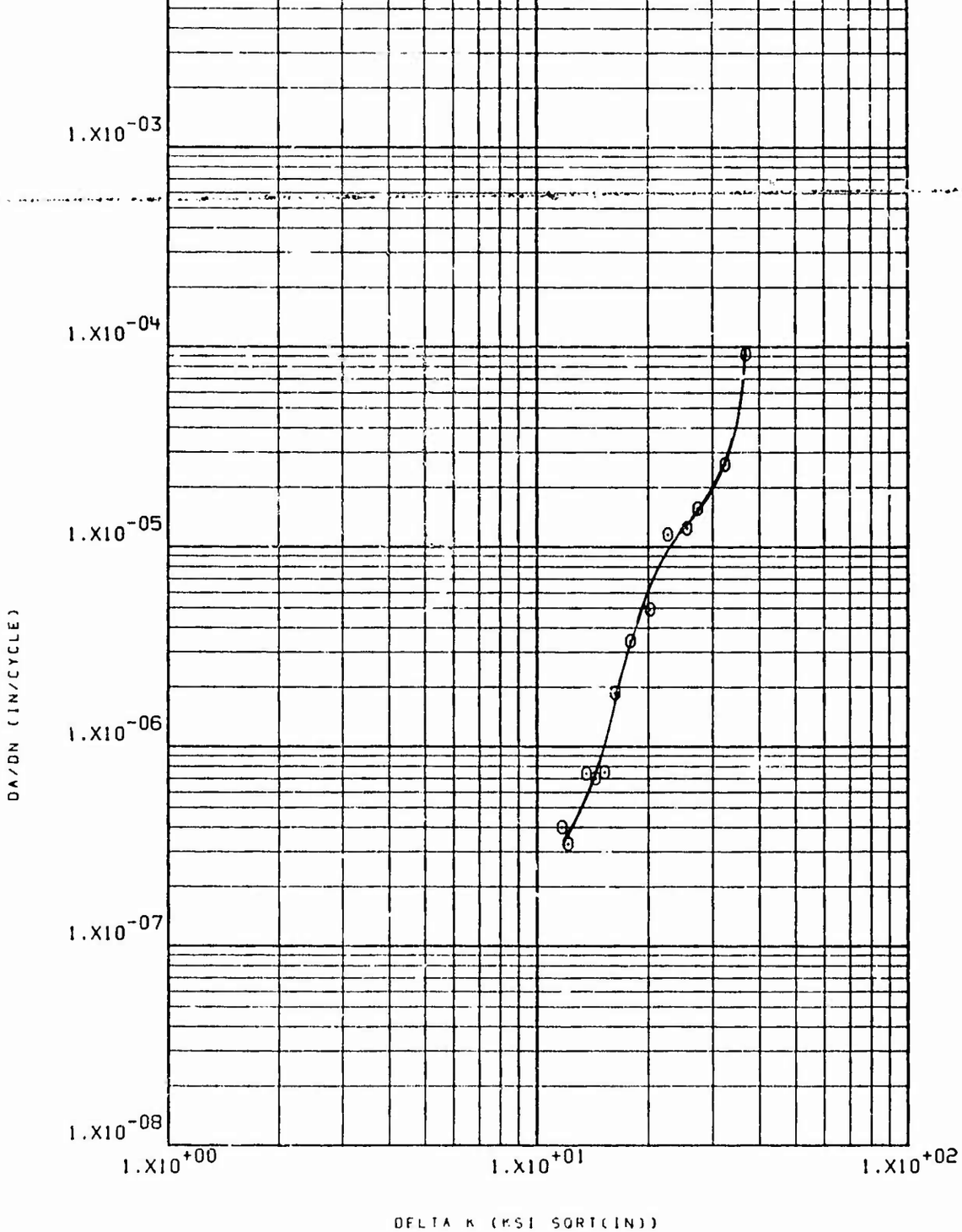
76 NRW 61-151 TI 6AL-4V RA STW RT R=.08 60CPM



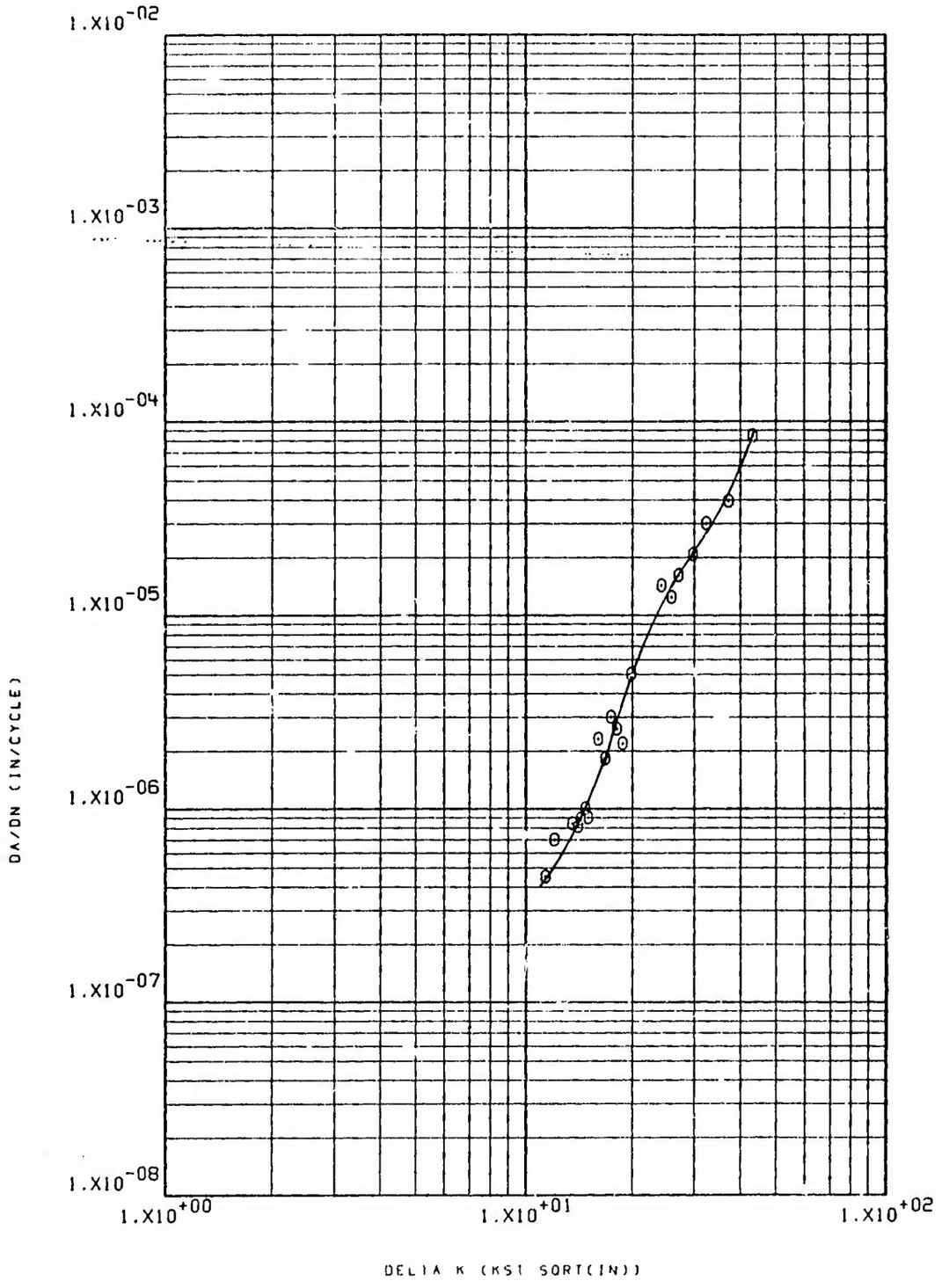
77 NDW LAI-B TI 6AL-4V DBTC STW RT R=.08 60CPM



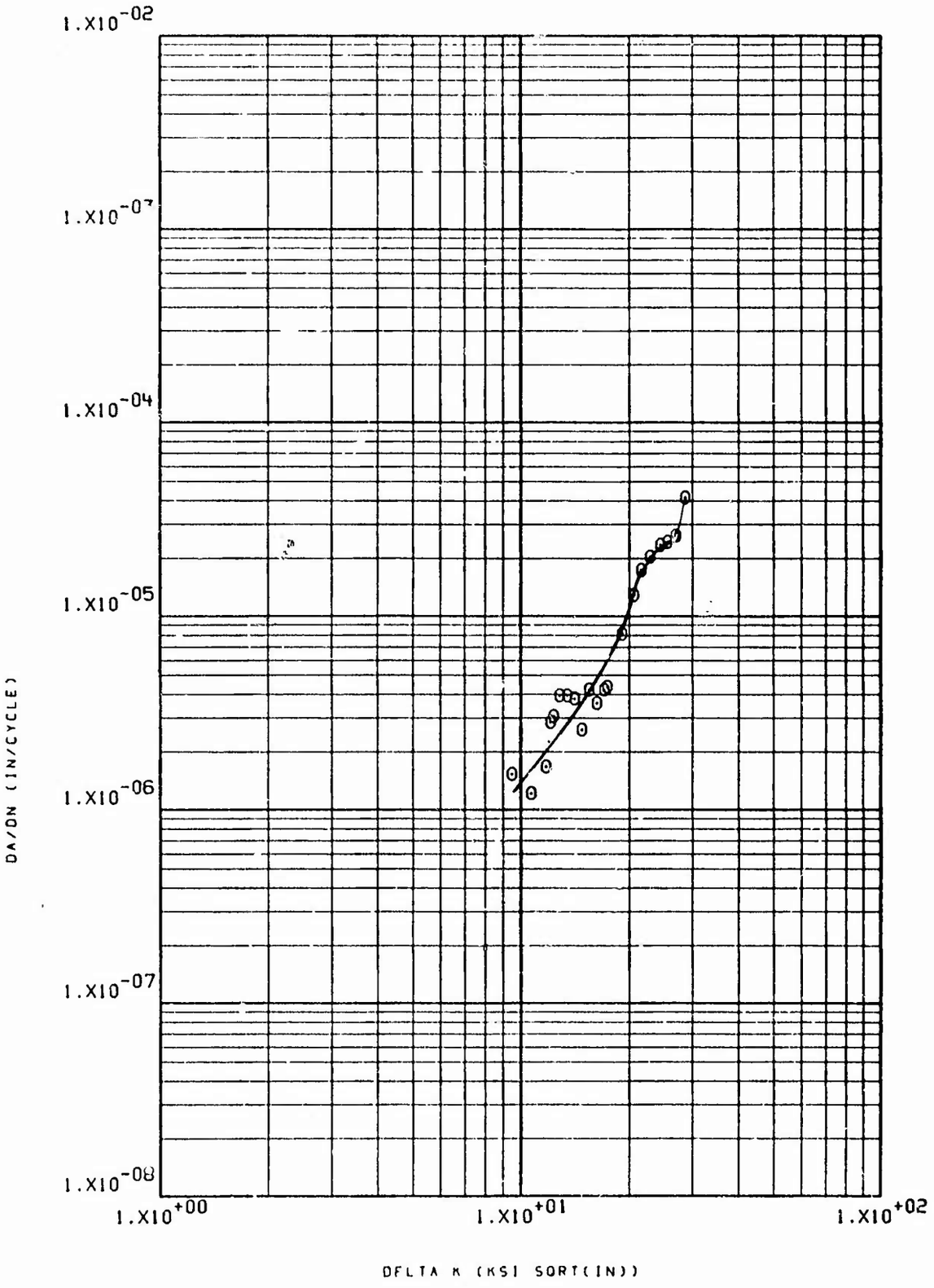
77 NWP LD12-B Ti-6AL-4V STW RT R=.08 60CPM DBT + PC



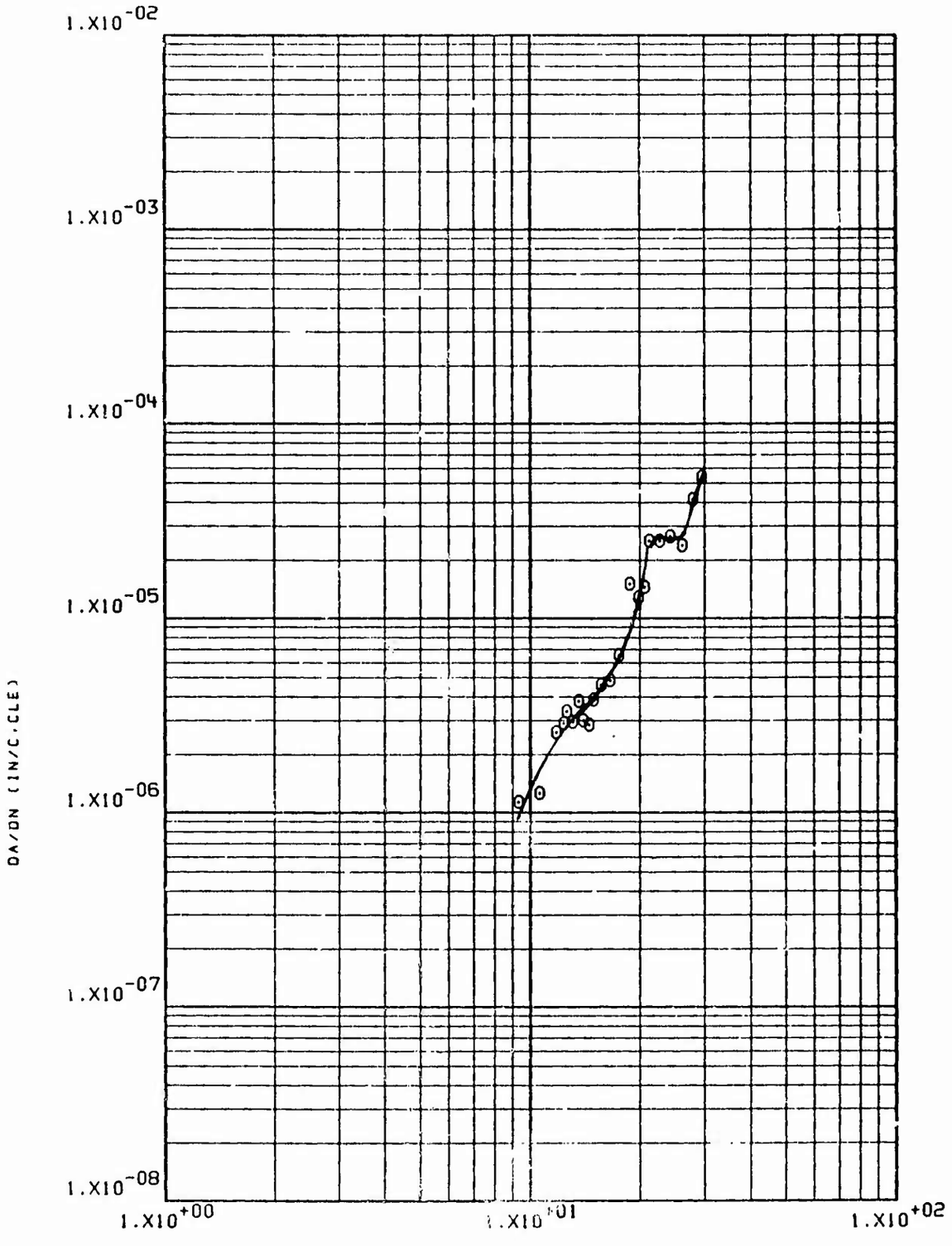
77 NWR 60 1 15A TI-6AL-4V DBTC + TR SUMP RT R=.08 60CPM



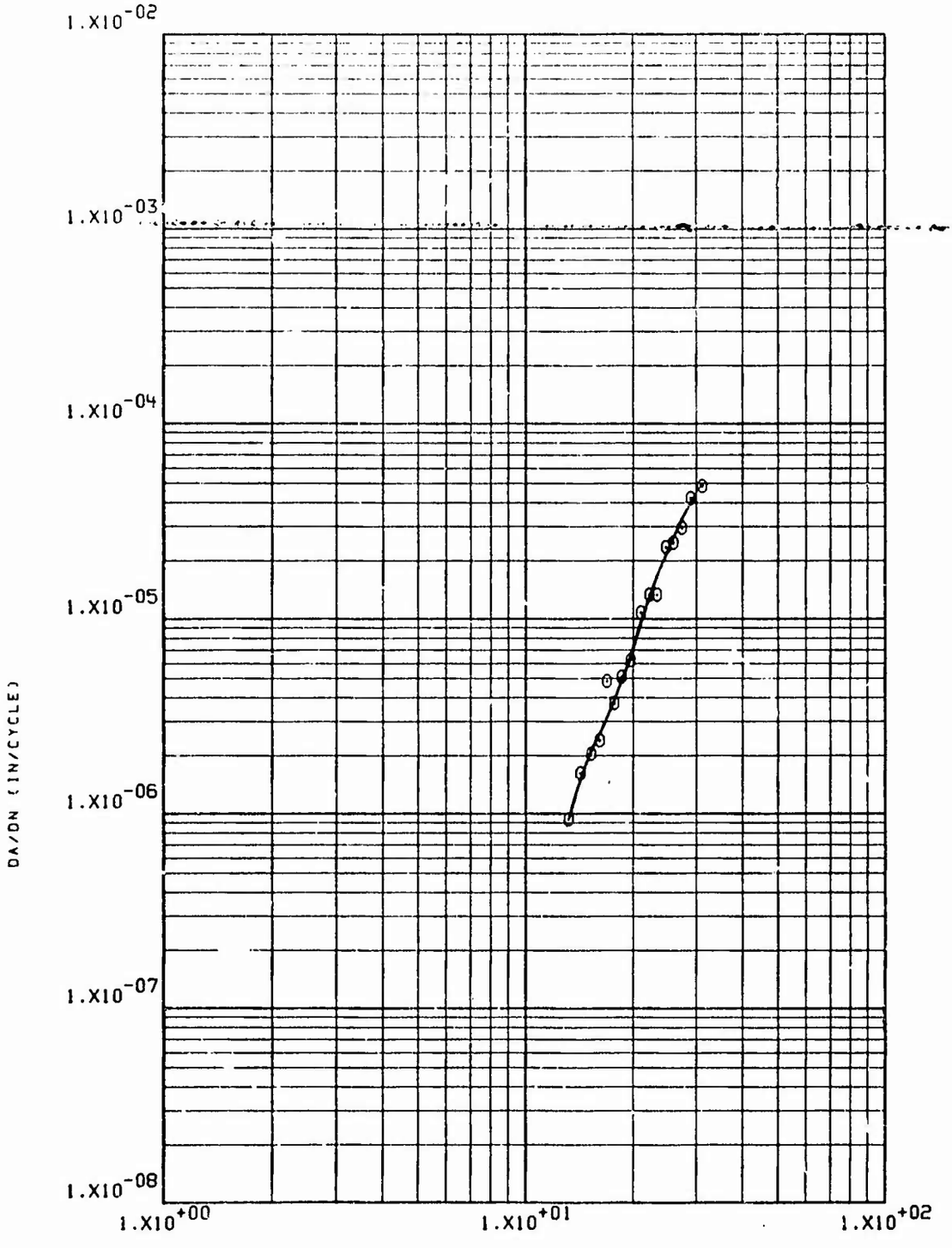
77 NWR YO 1-158 Ti-6AL-4V DBTC RT R=.08 60CPM STW + JP4



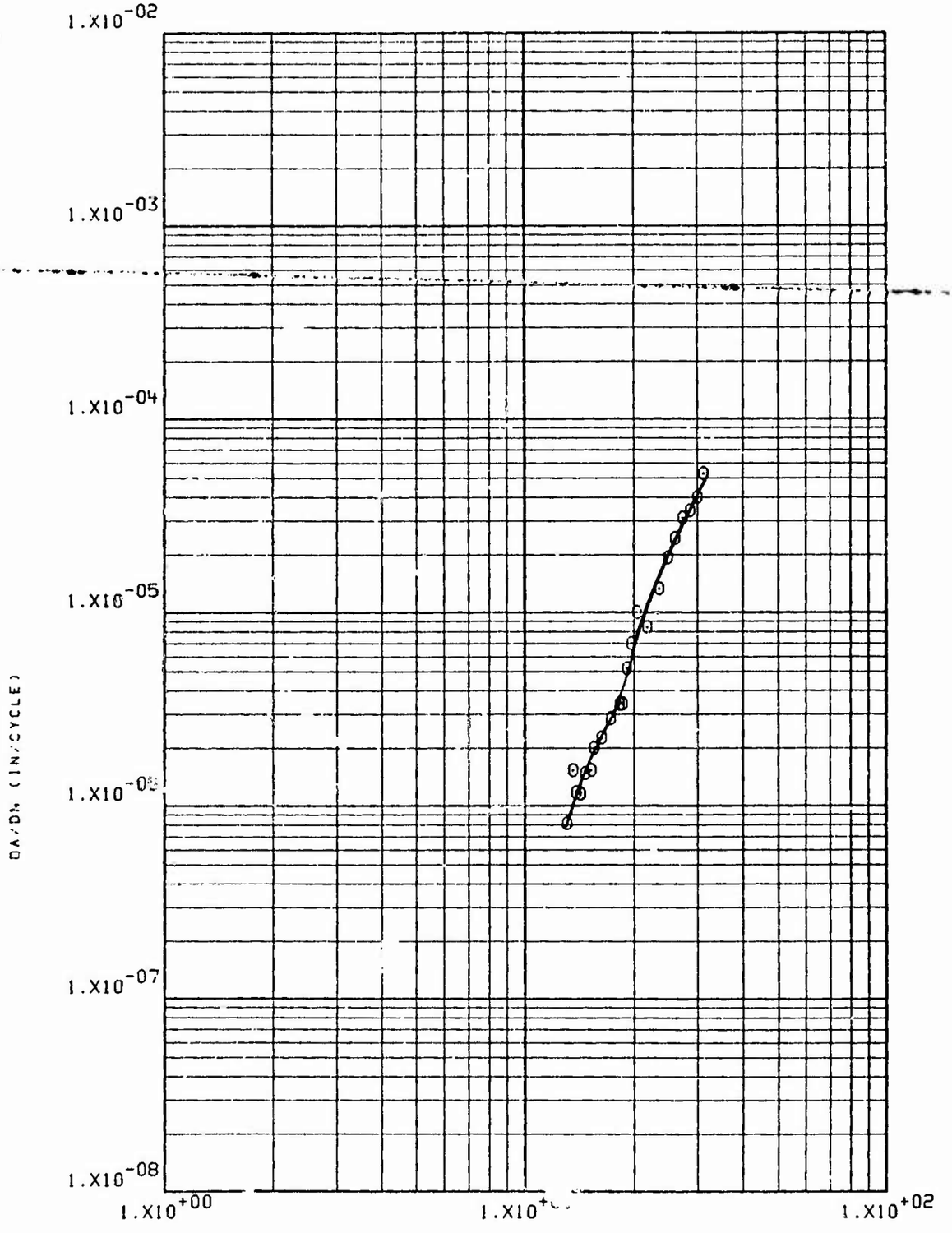
17 NRW LA-1 DB TI-6AL-4V SUMP PT60CPM R=.08 0



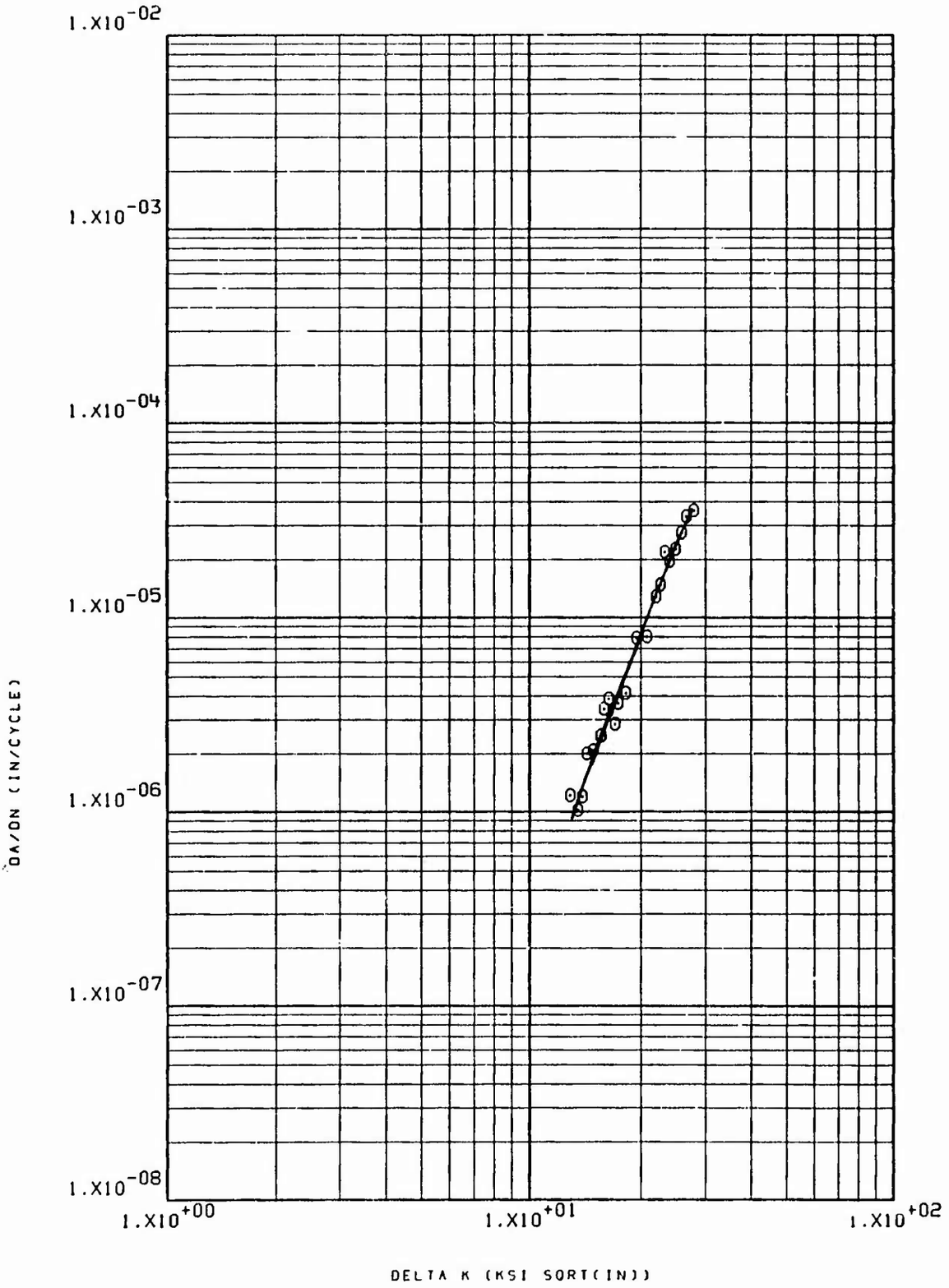
77 NWR L 0-12 DB WR/WR GAL-4V RT STW 60CPM R=.08



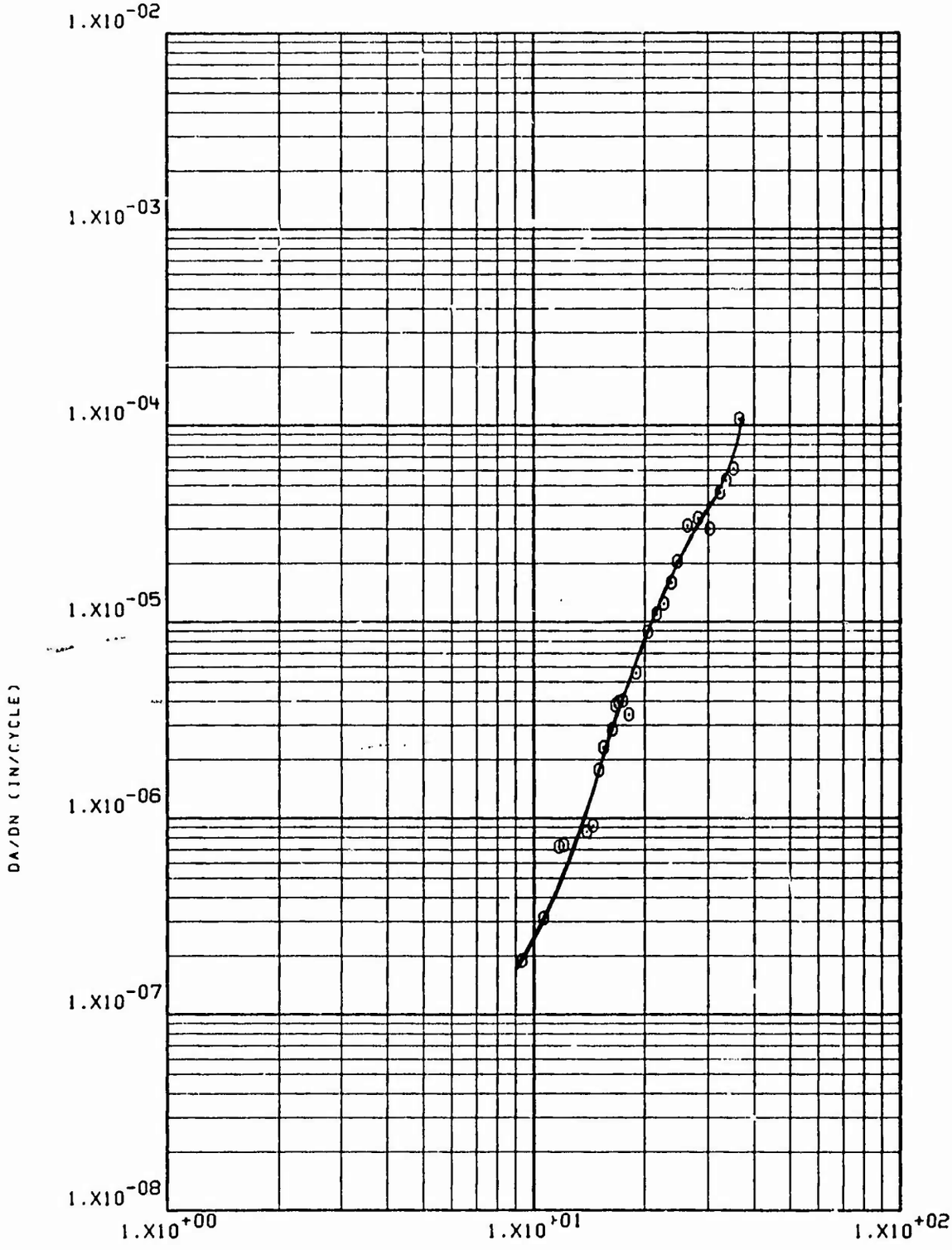
77 NRW YD-1-4 TI-6AL-4V RA STW RT R=0.08 60CPM



77 NWP YD 1-5 RA PLATE TI-6AL-4V SUMP RT 60CPM R=.08



77 NRW YD 3-4 RA TI-6AL-4V SUMP RT 60CPM R=.08



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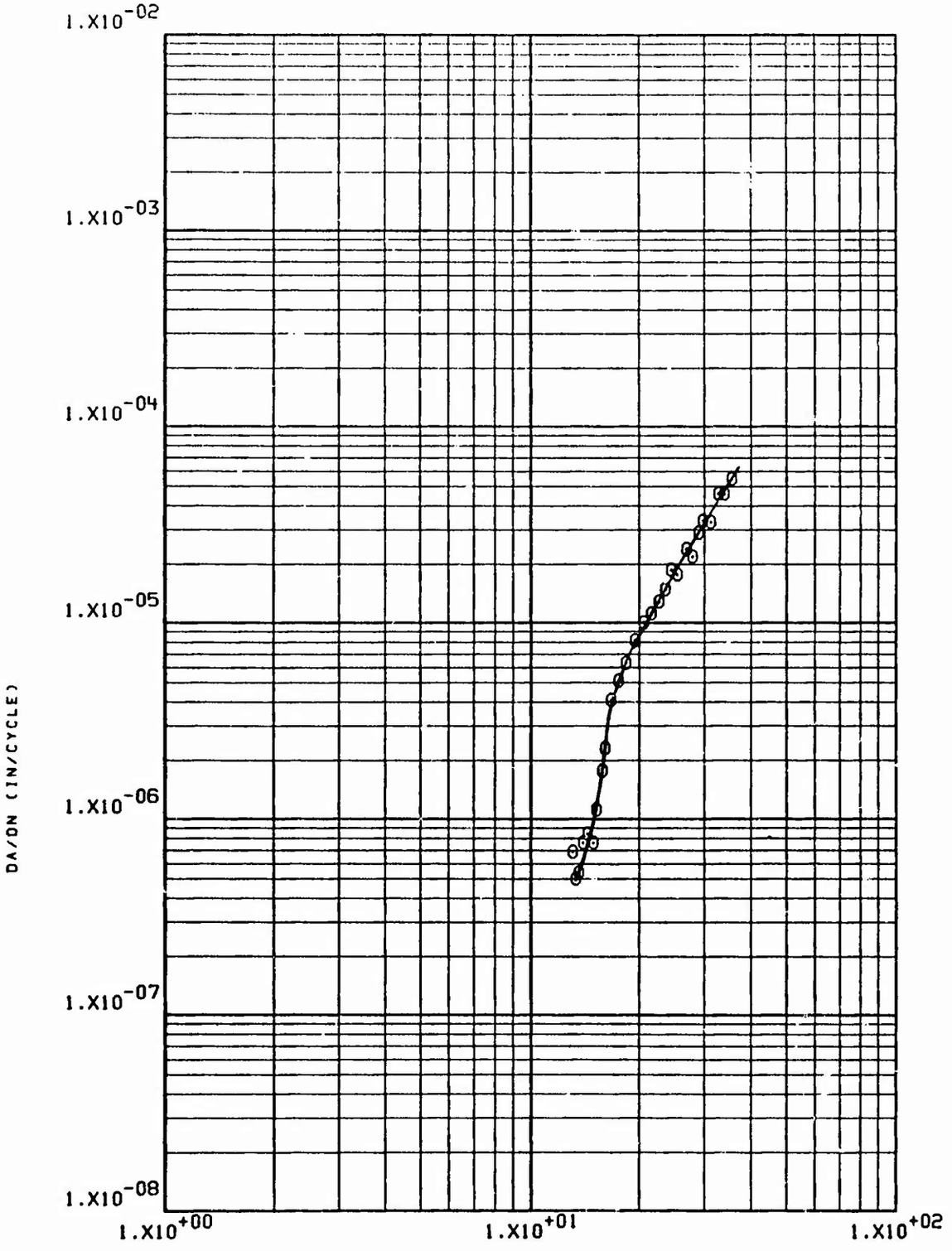

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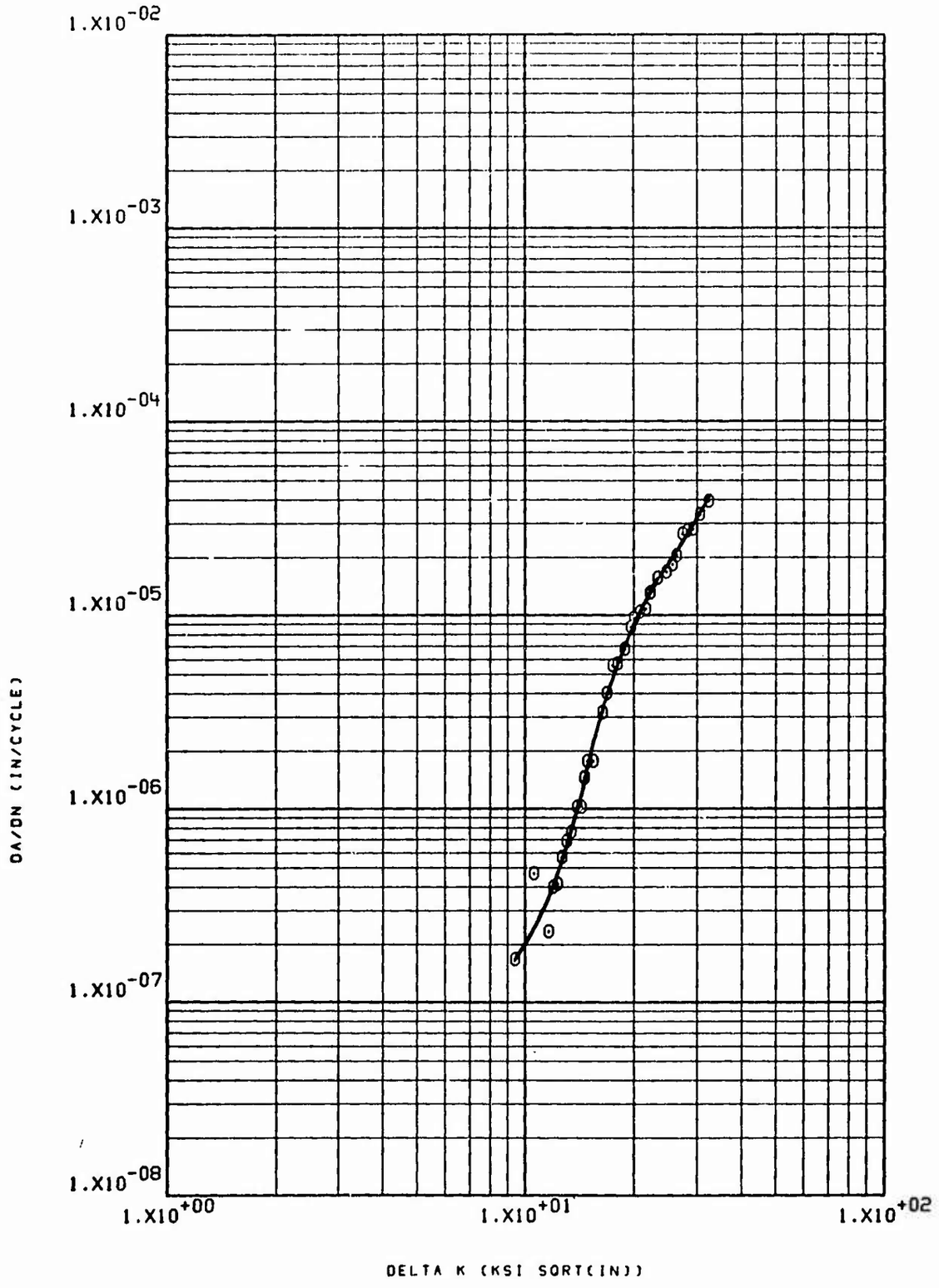

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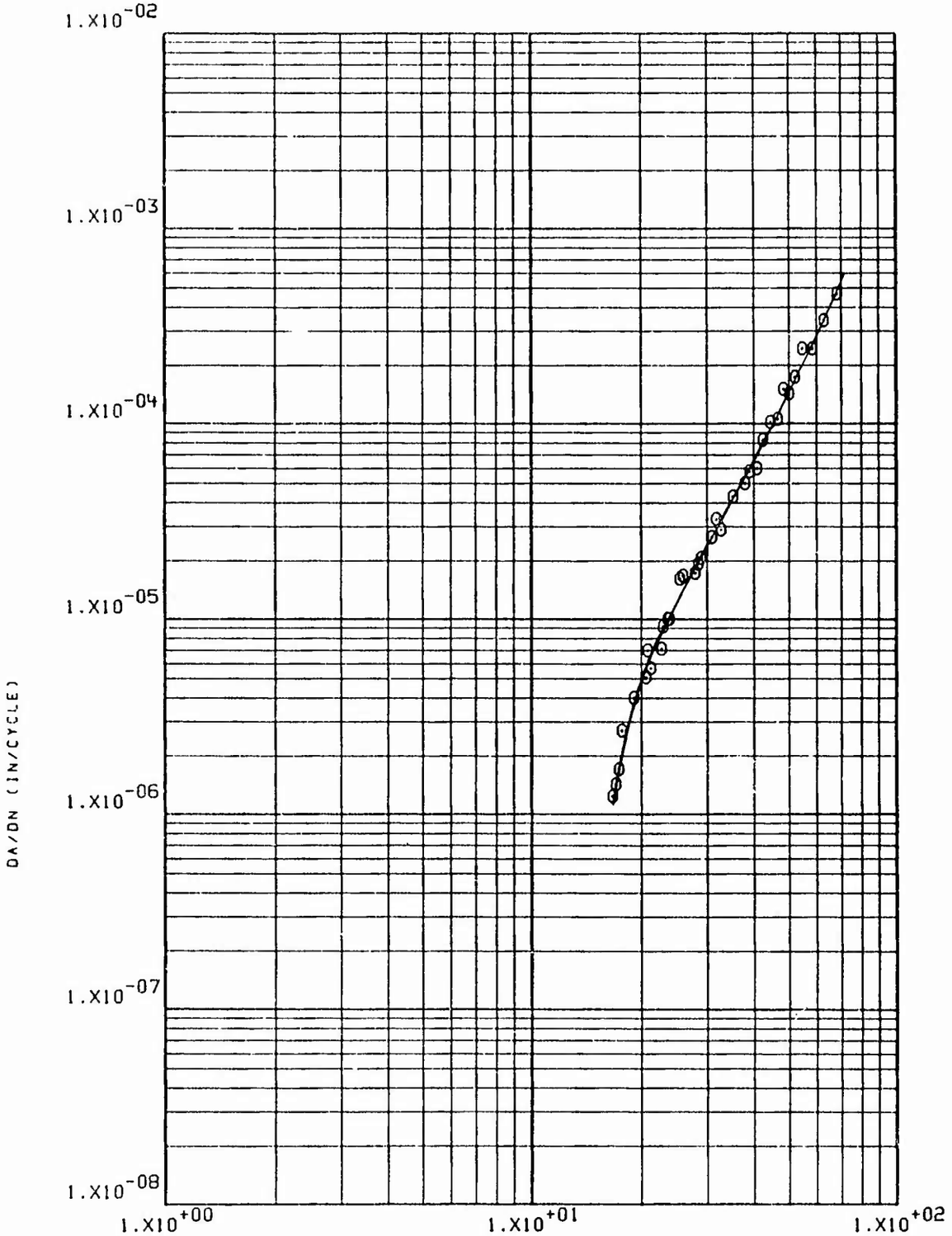
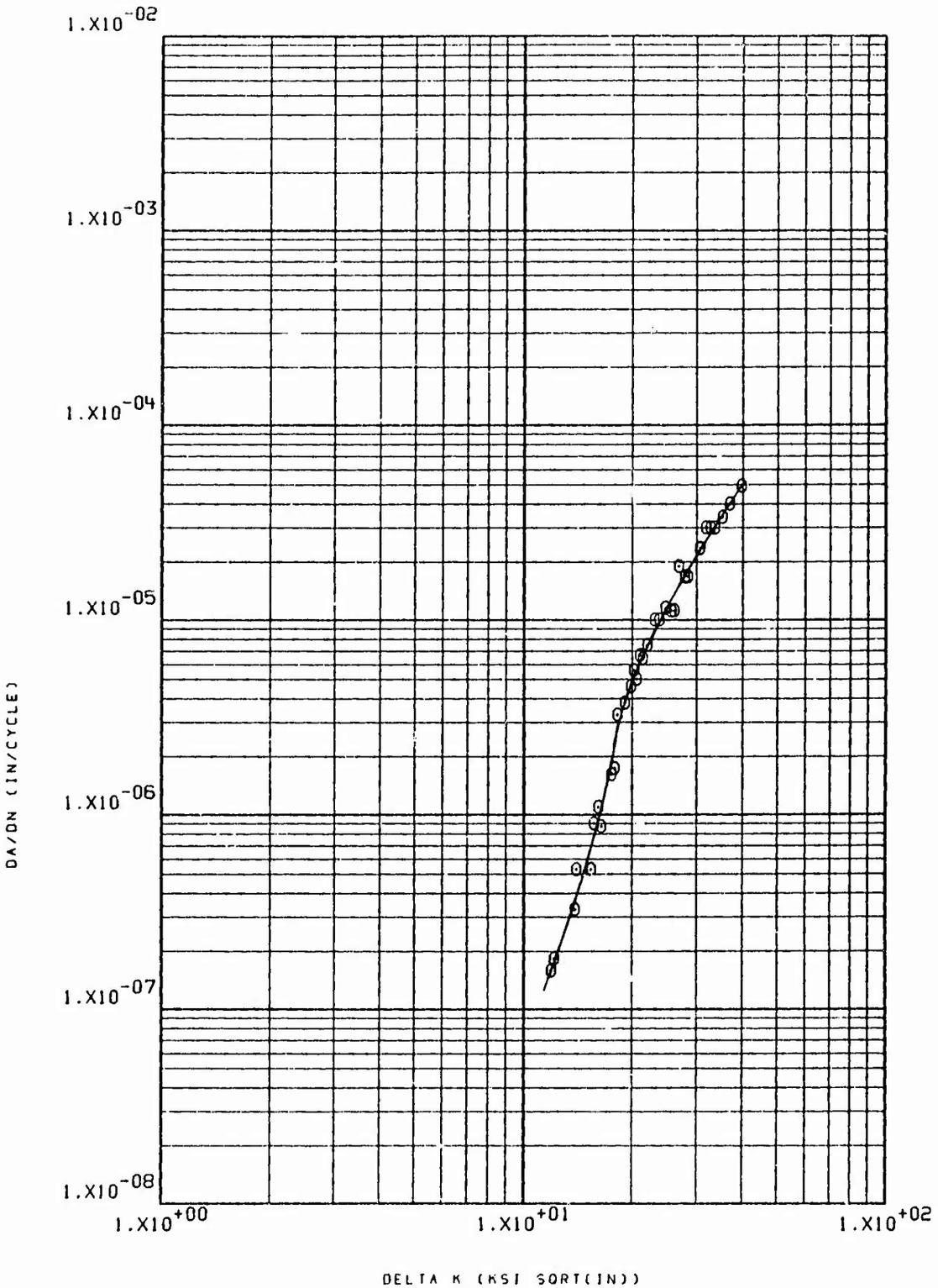
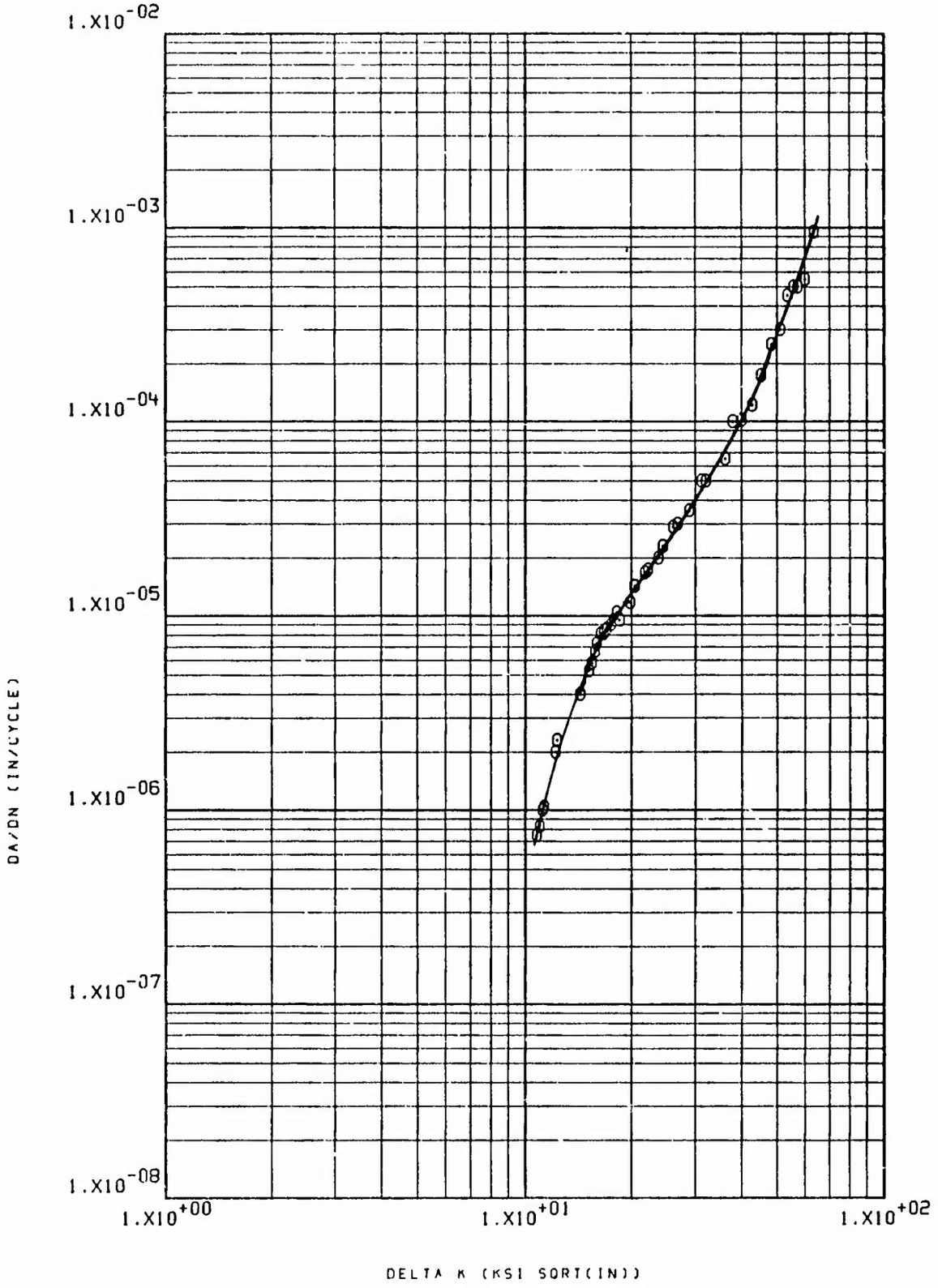


73 NRW 77-1 TI 6AL-4V RA HD EDGE LHA RT R=.08 60CPM



79 NRW 77-2 TI 6AL-4V RA HD FRGE LHA RT R=.08 360CPM



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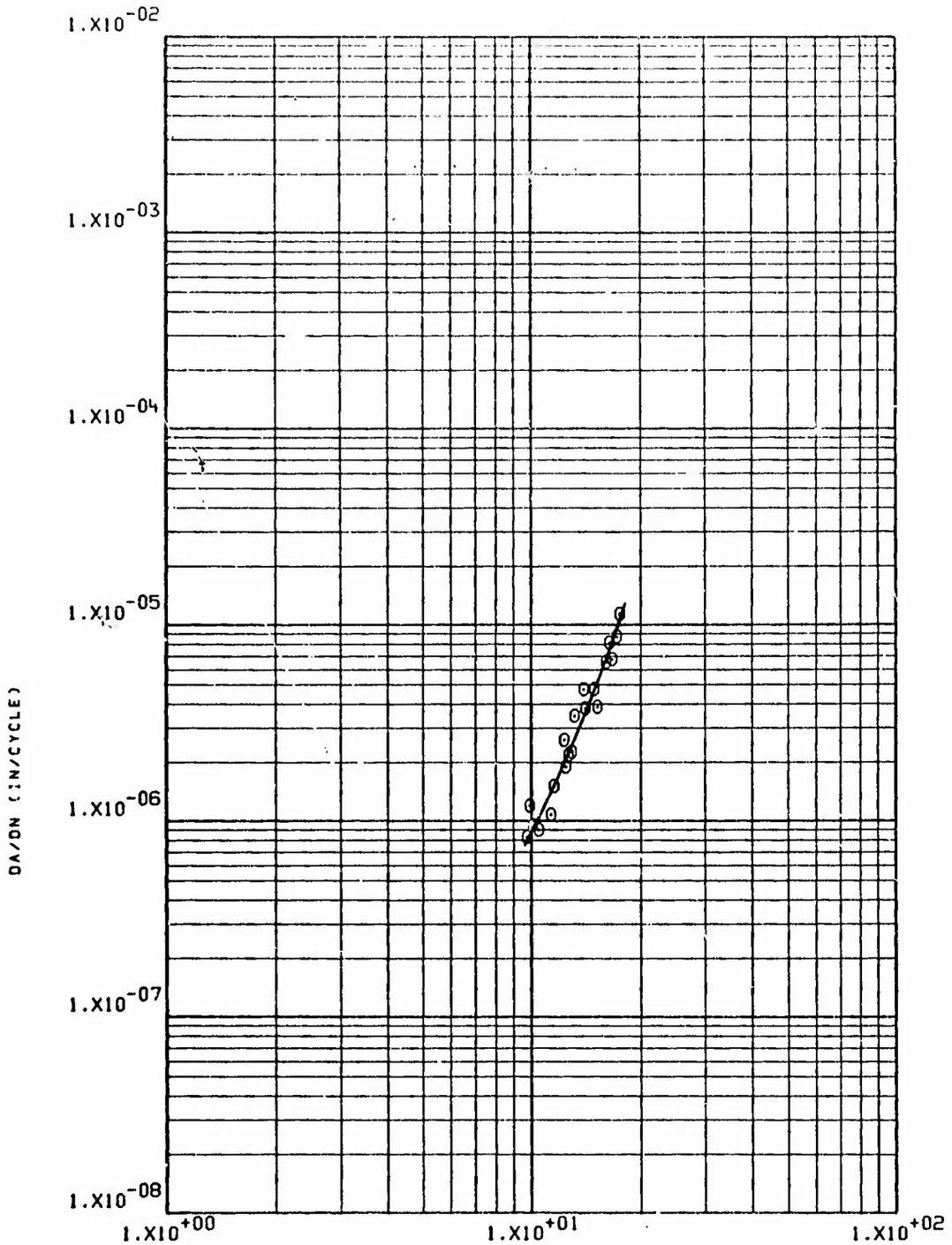
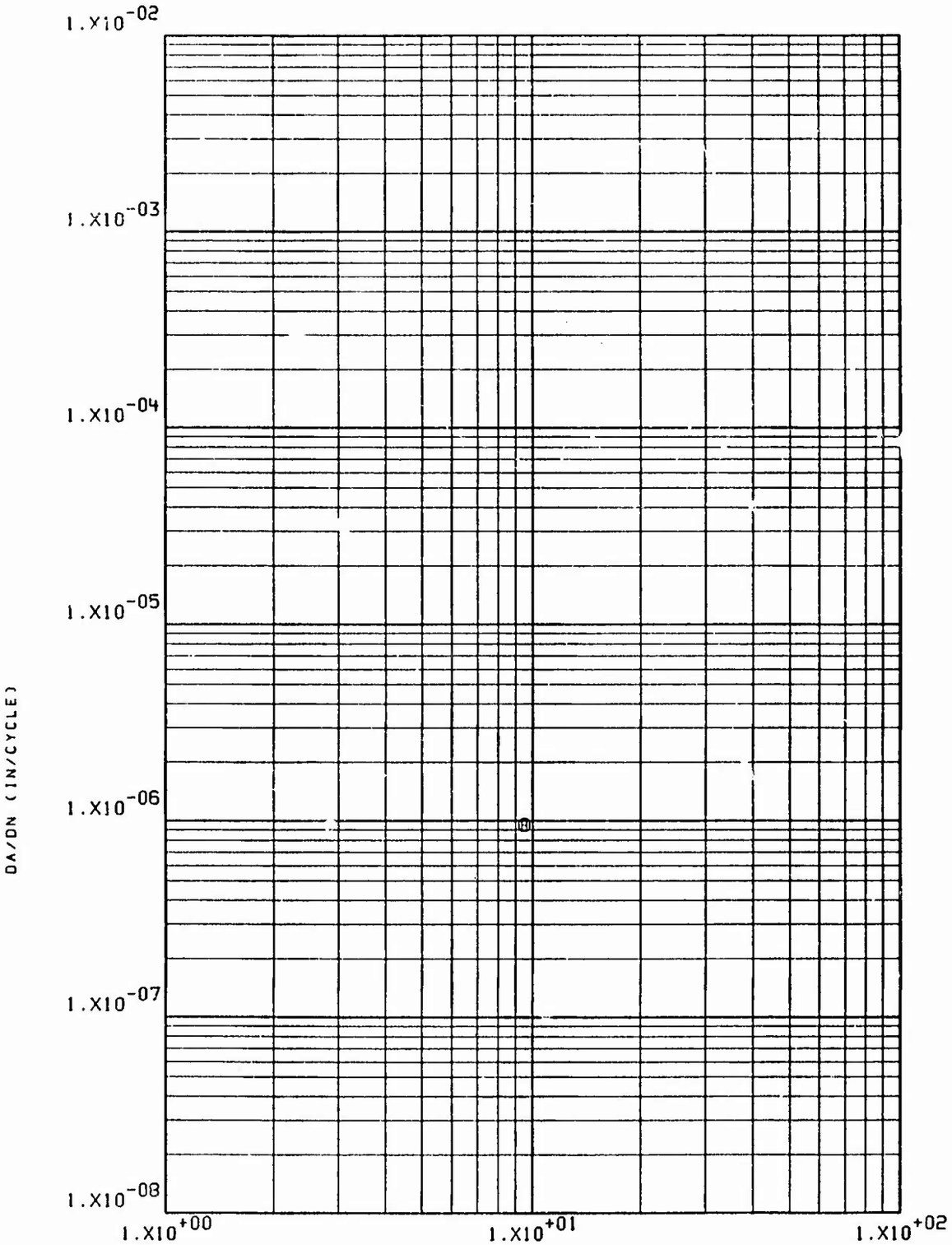
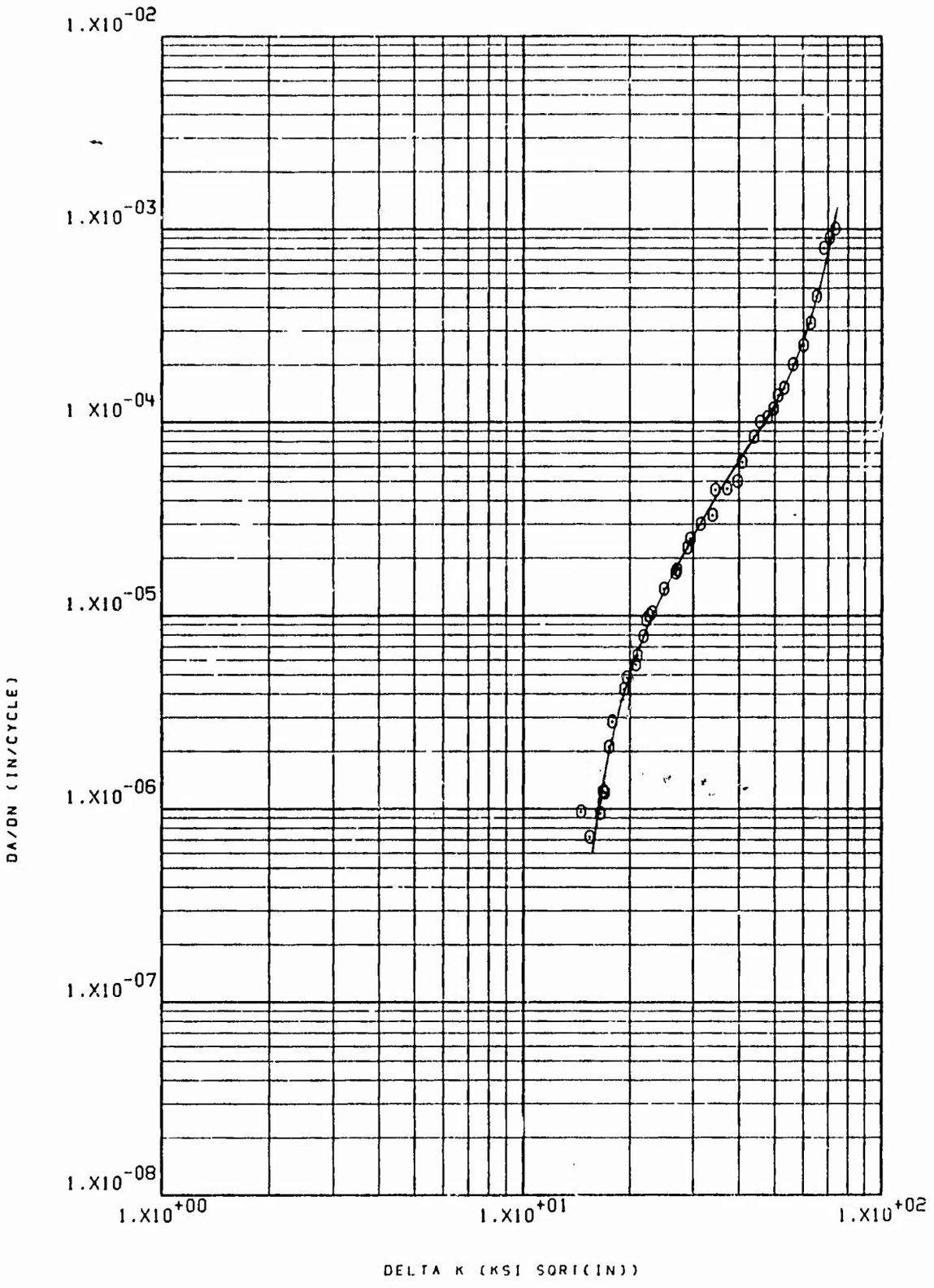


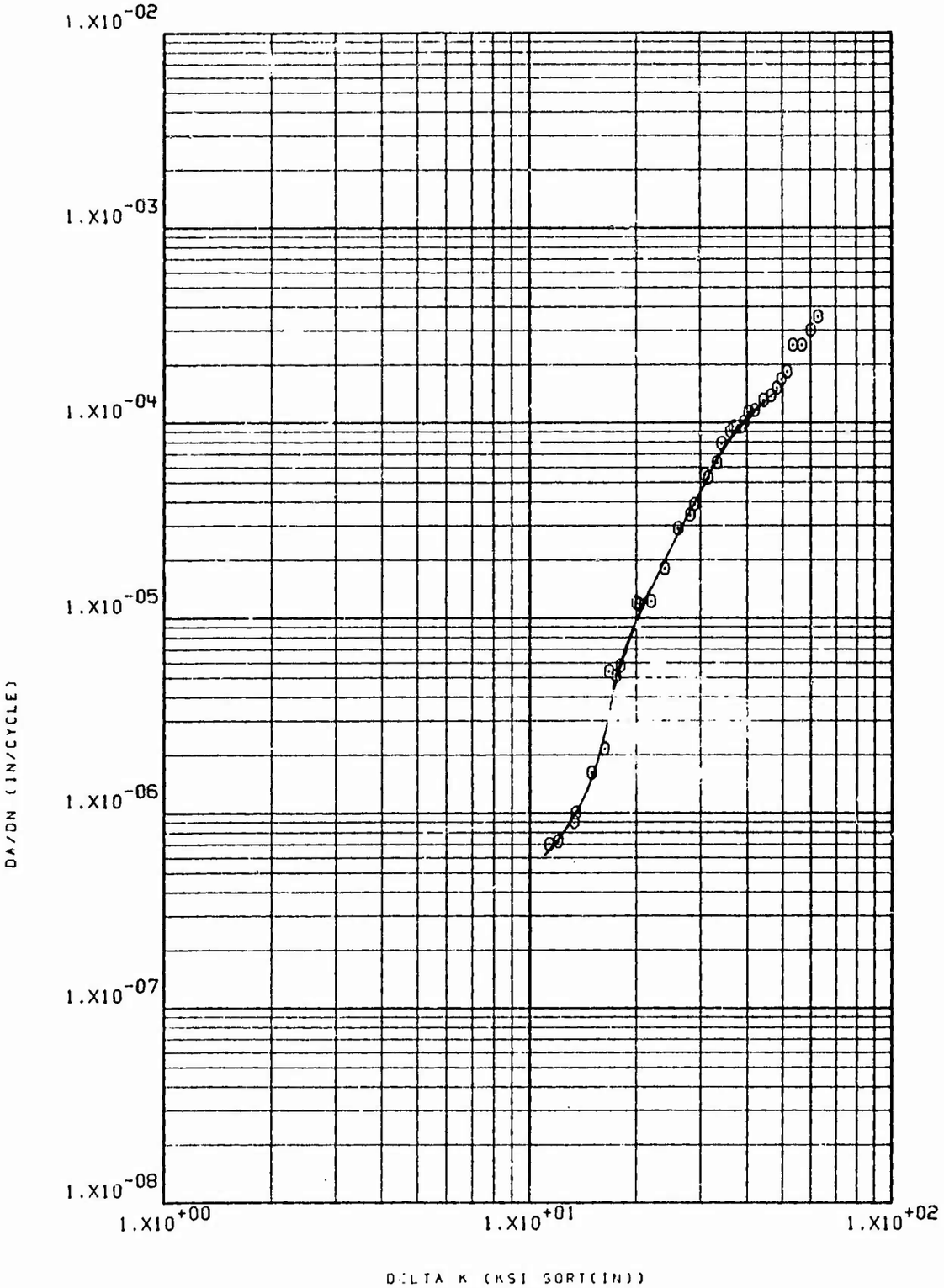
79 NRW 77-4 TI-6AL-4V RA HAND-FORGED LHA RT R=0.5 360CPM



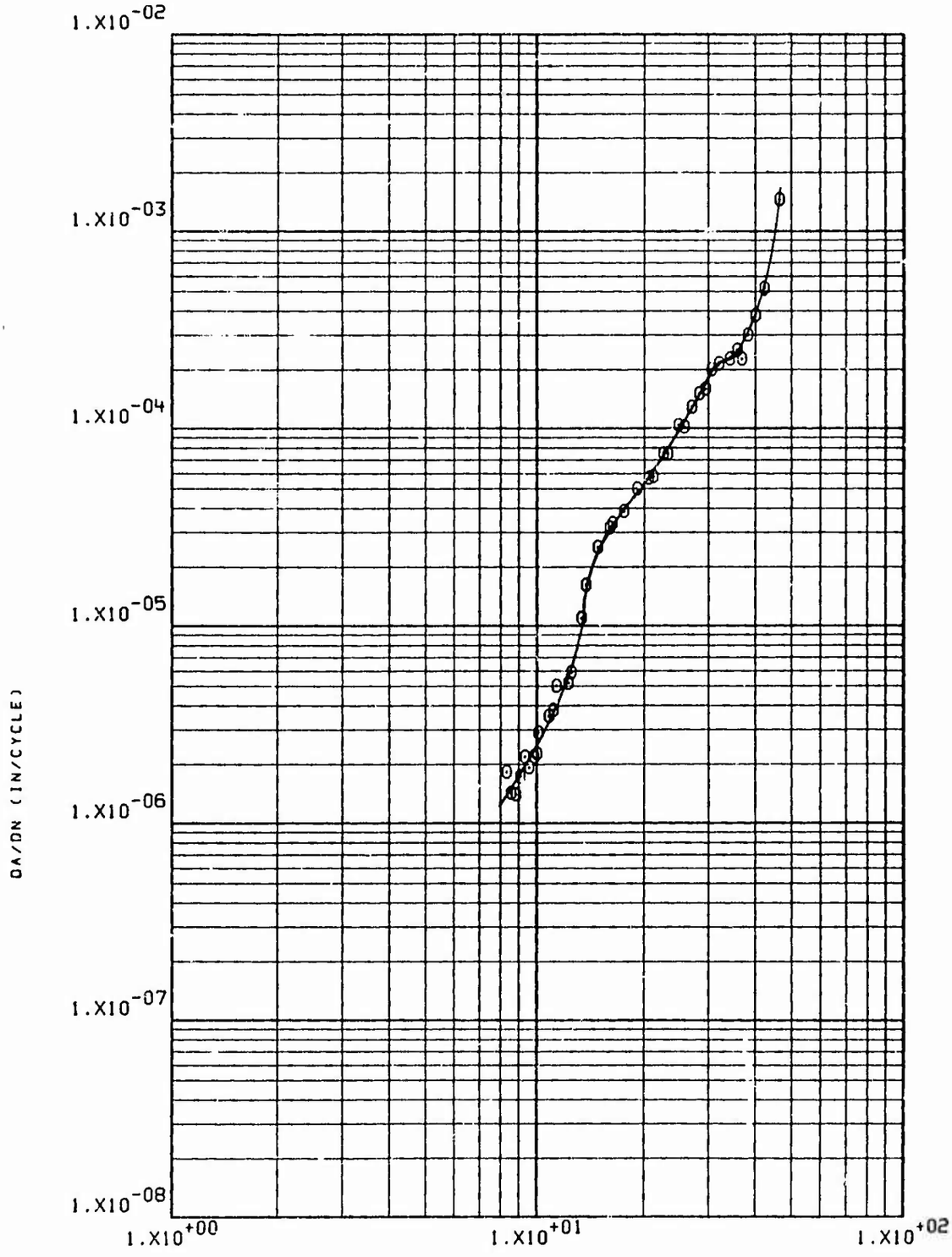
79 NRW 77-5 TI-6AL-4V RA SUMP RT R=0.5 60CPM



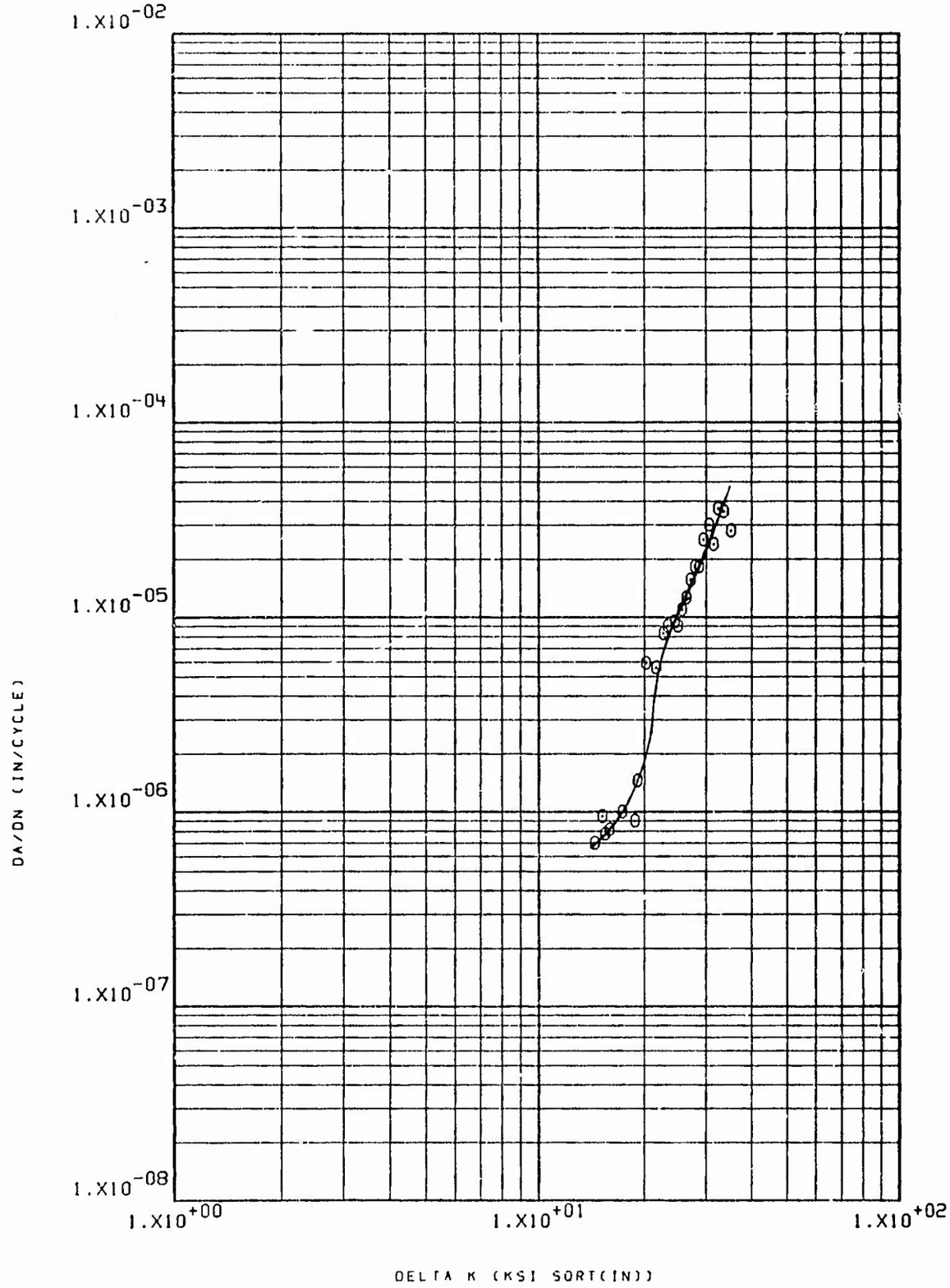
79 NWR 77-20 TI 6AL-4V RA LHA RT R .08 360CPM



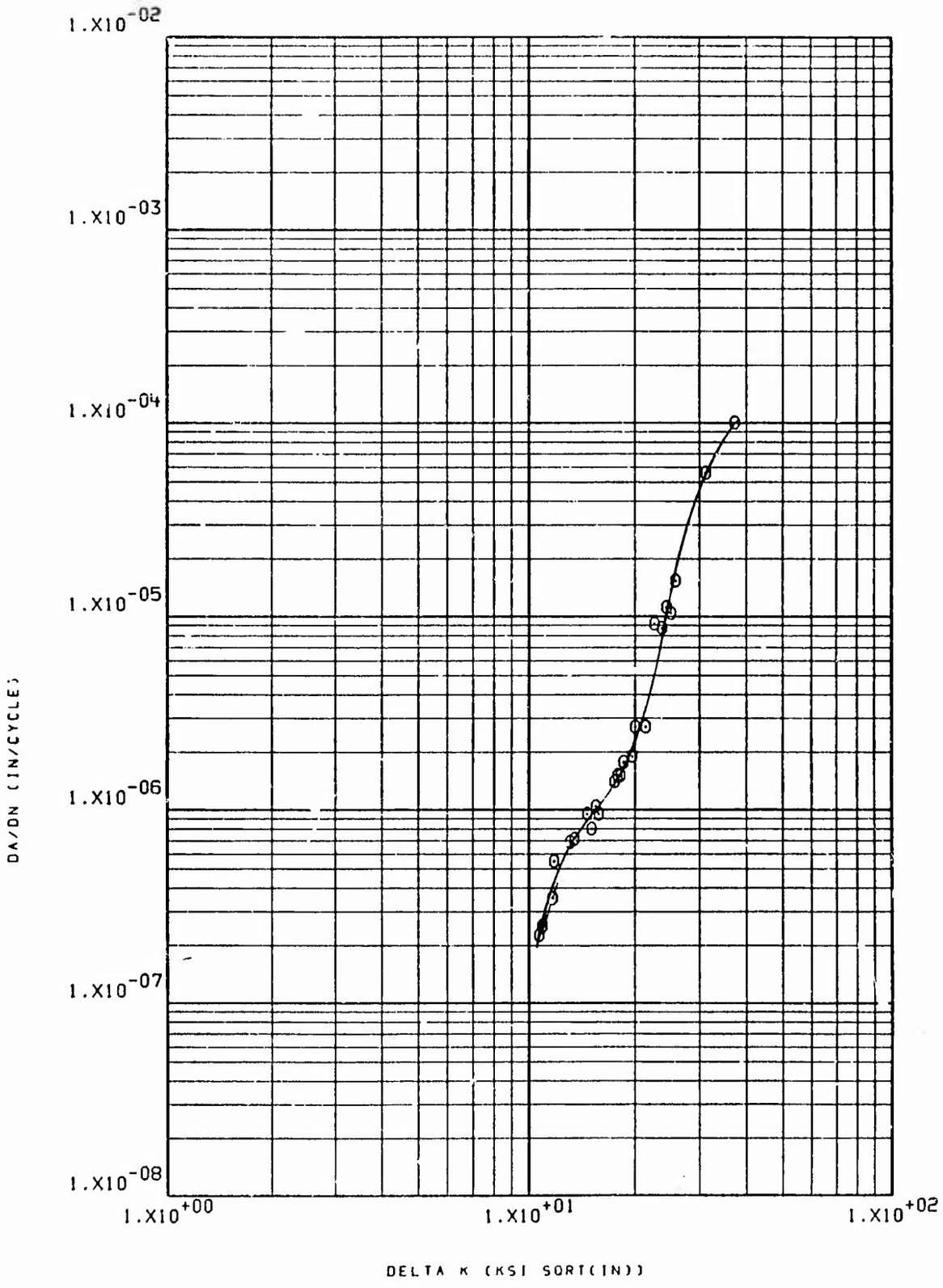
79 NWR 77-21 TI 6AL-4V HAND FORGED RA SUMP RT R=.08 60CPM



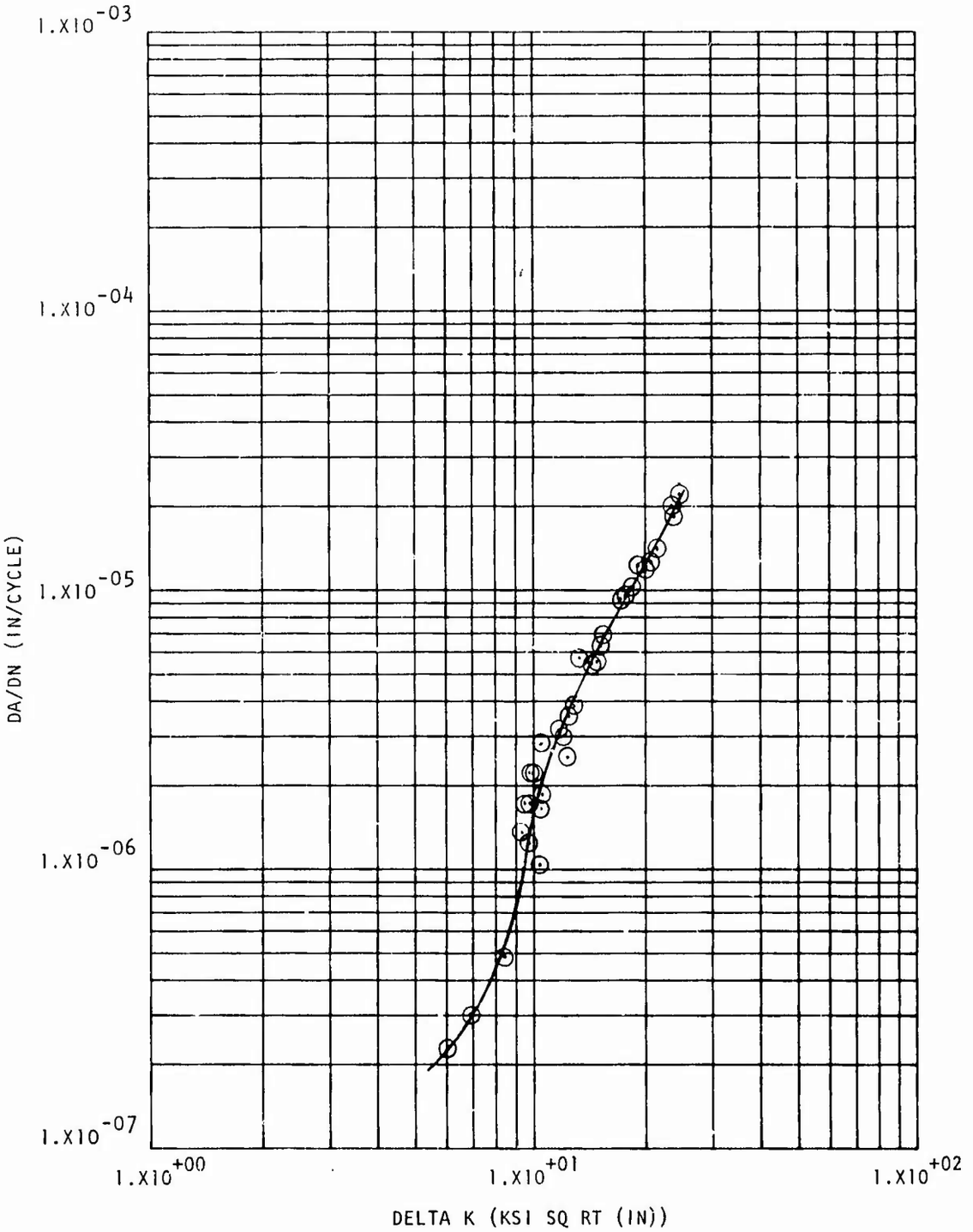
79-NWR 77-22 TI 6AL-4V RA SUMP RT R=0.5 60 CPM



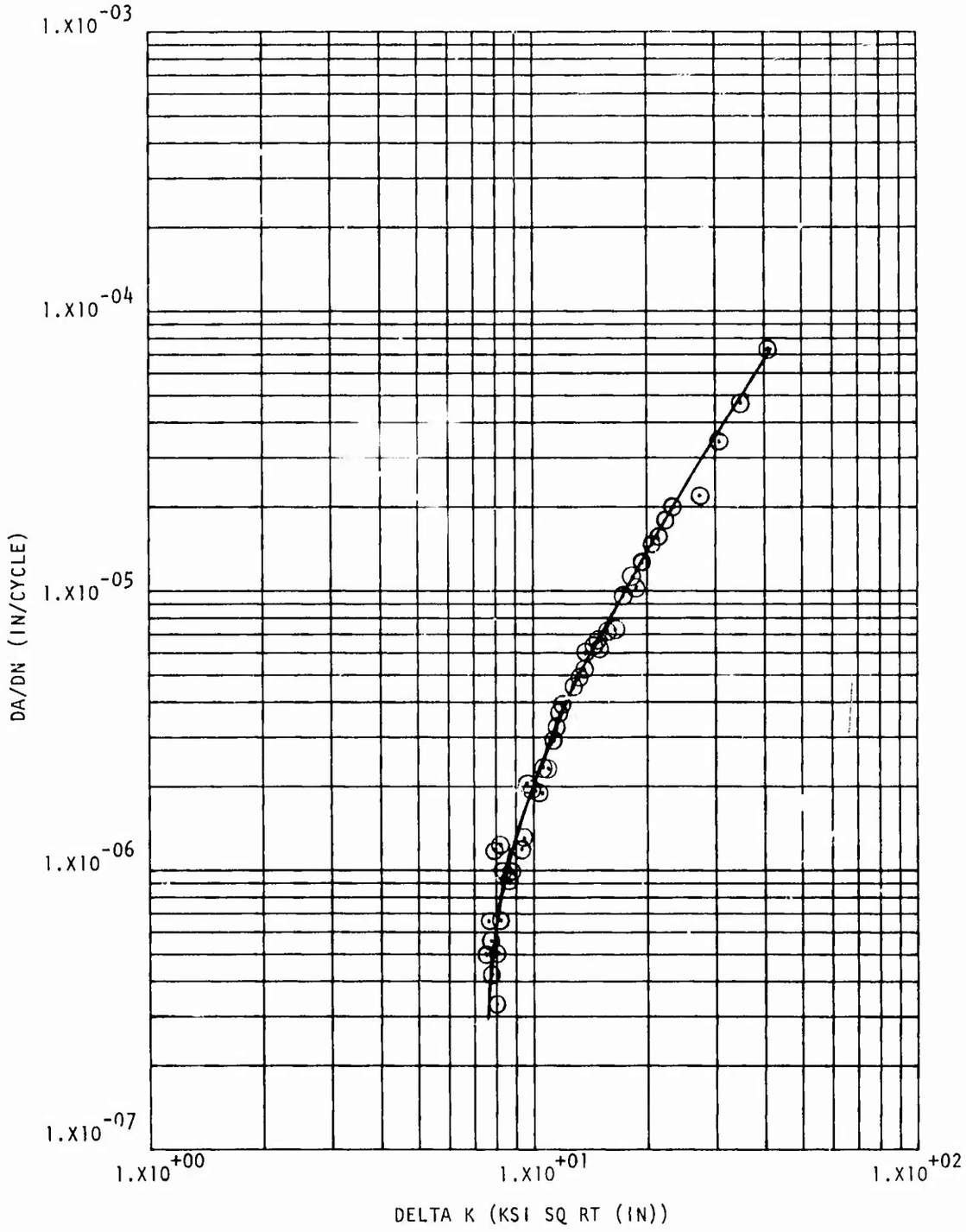
79 NPW 77-23 TI 6AL-4V RA FUEL RT R=.08 60CPM



79 NPW 77-24 TI6AL-4V RA SUMP RT R=.08 60CPM



80 NRW 84-5 Ti-6Al-4V MA LHA RT R = 0.08 60 CPM



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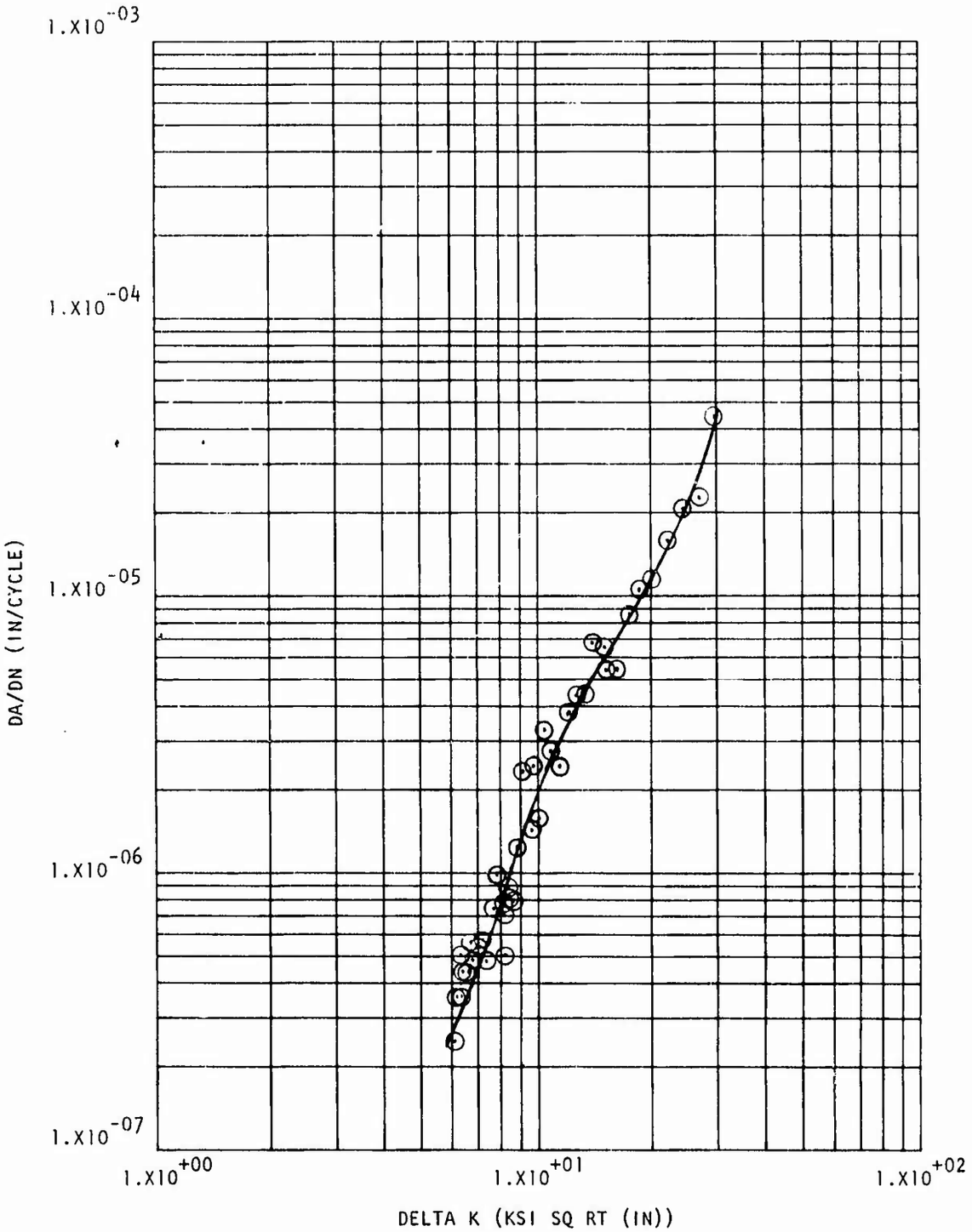

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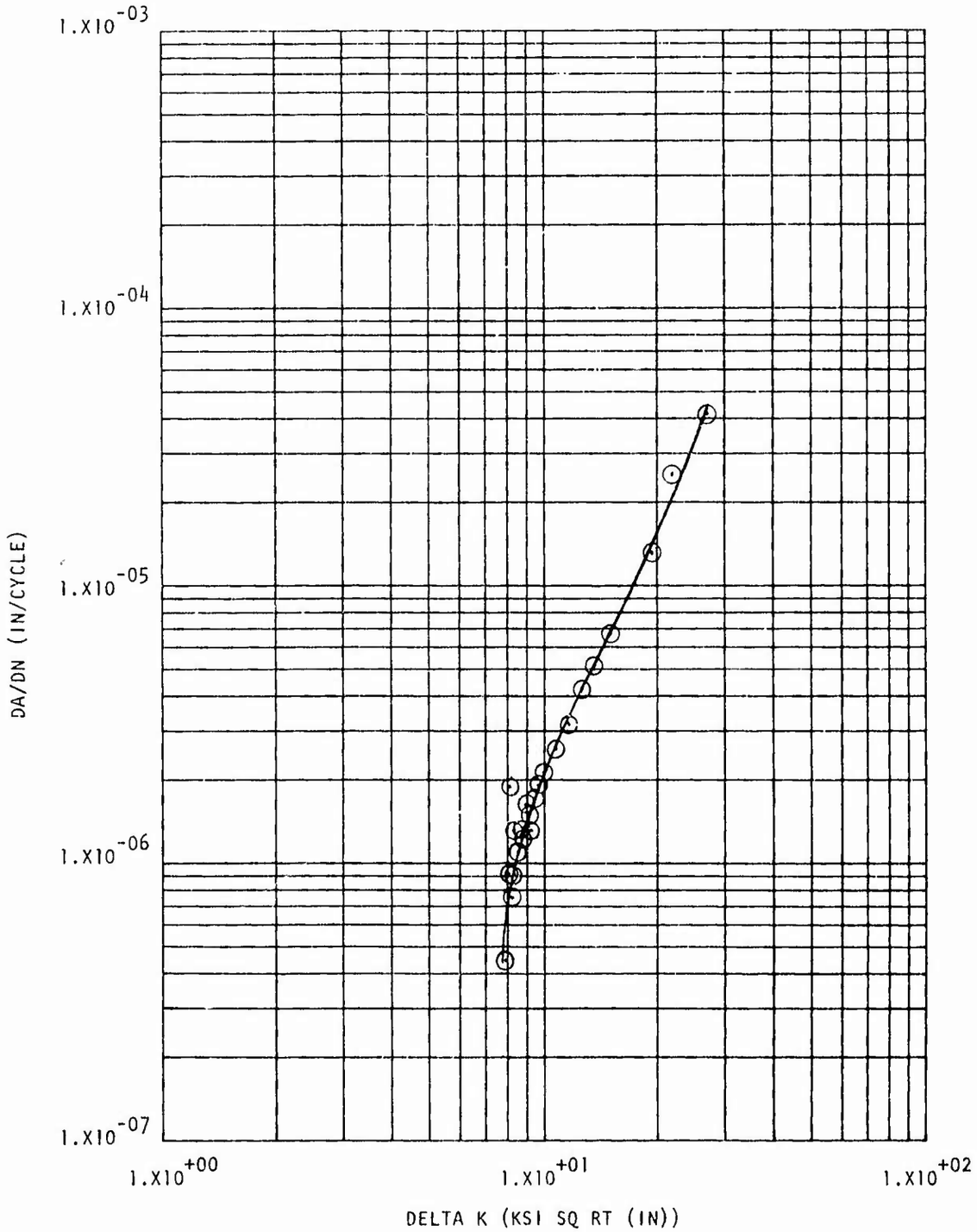

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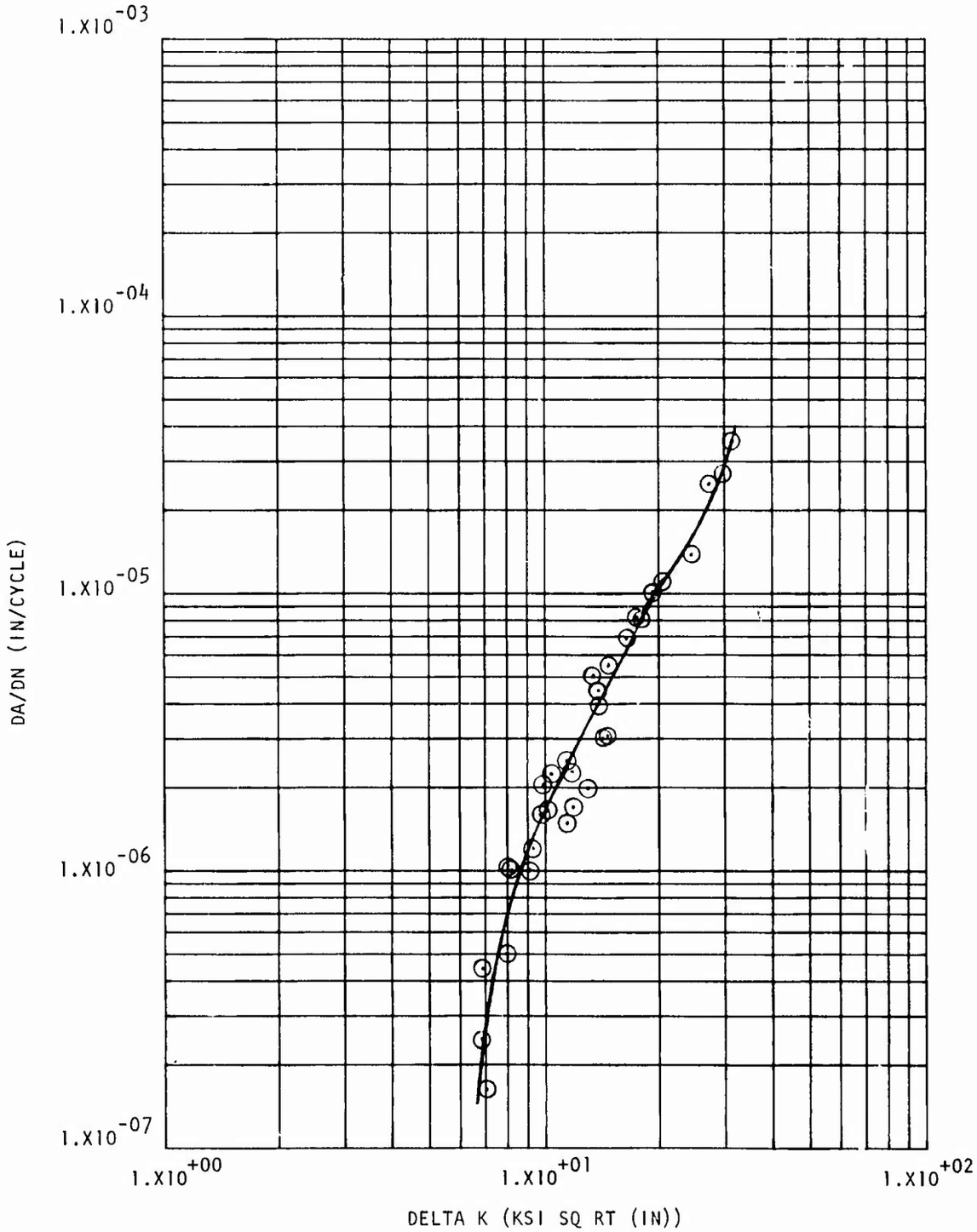
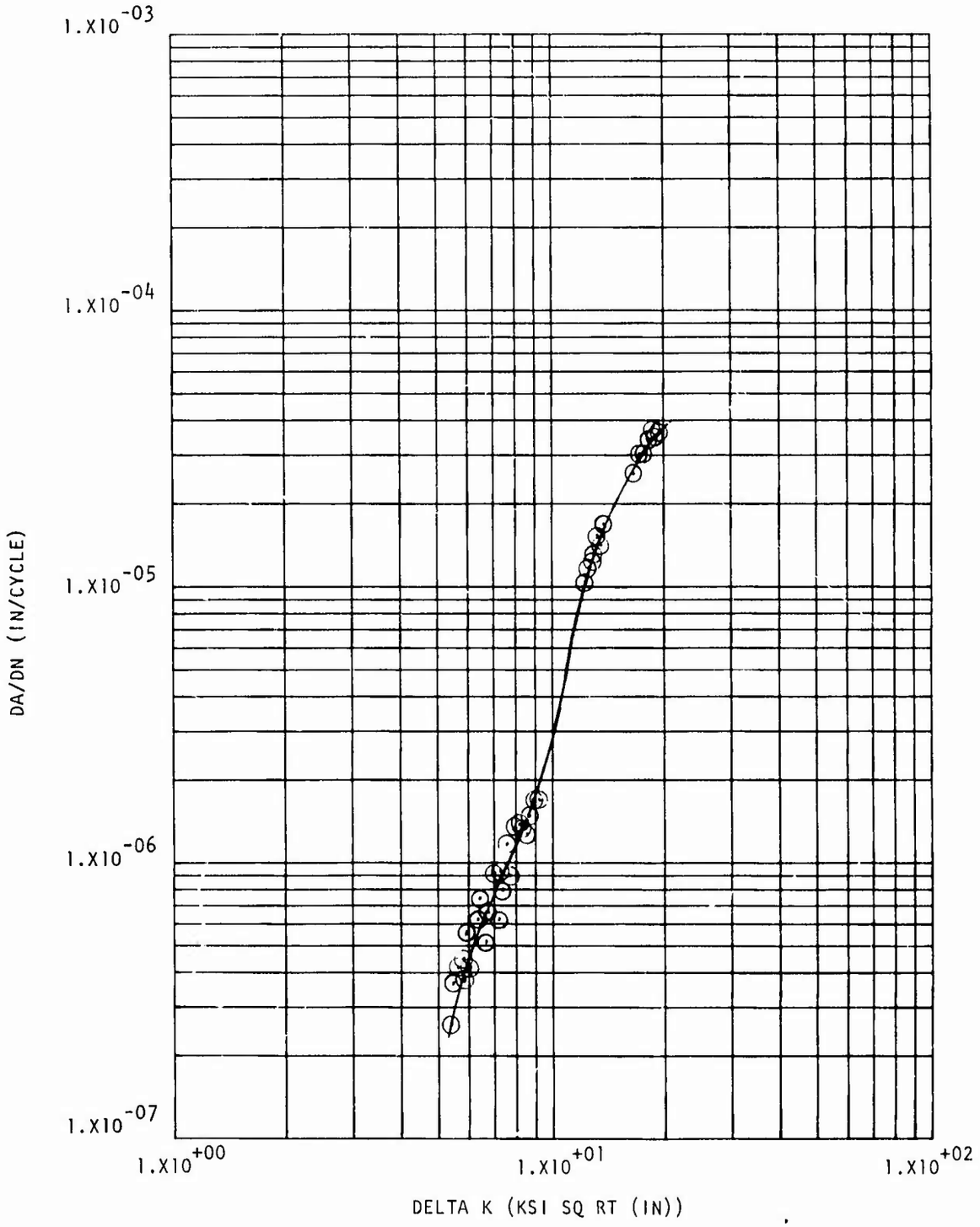


80 NRW 84-9 Ti-6Al-4V MA JP4 RT R = 0.08 360 CPM



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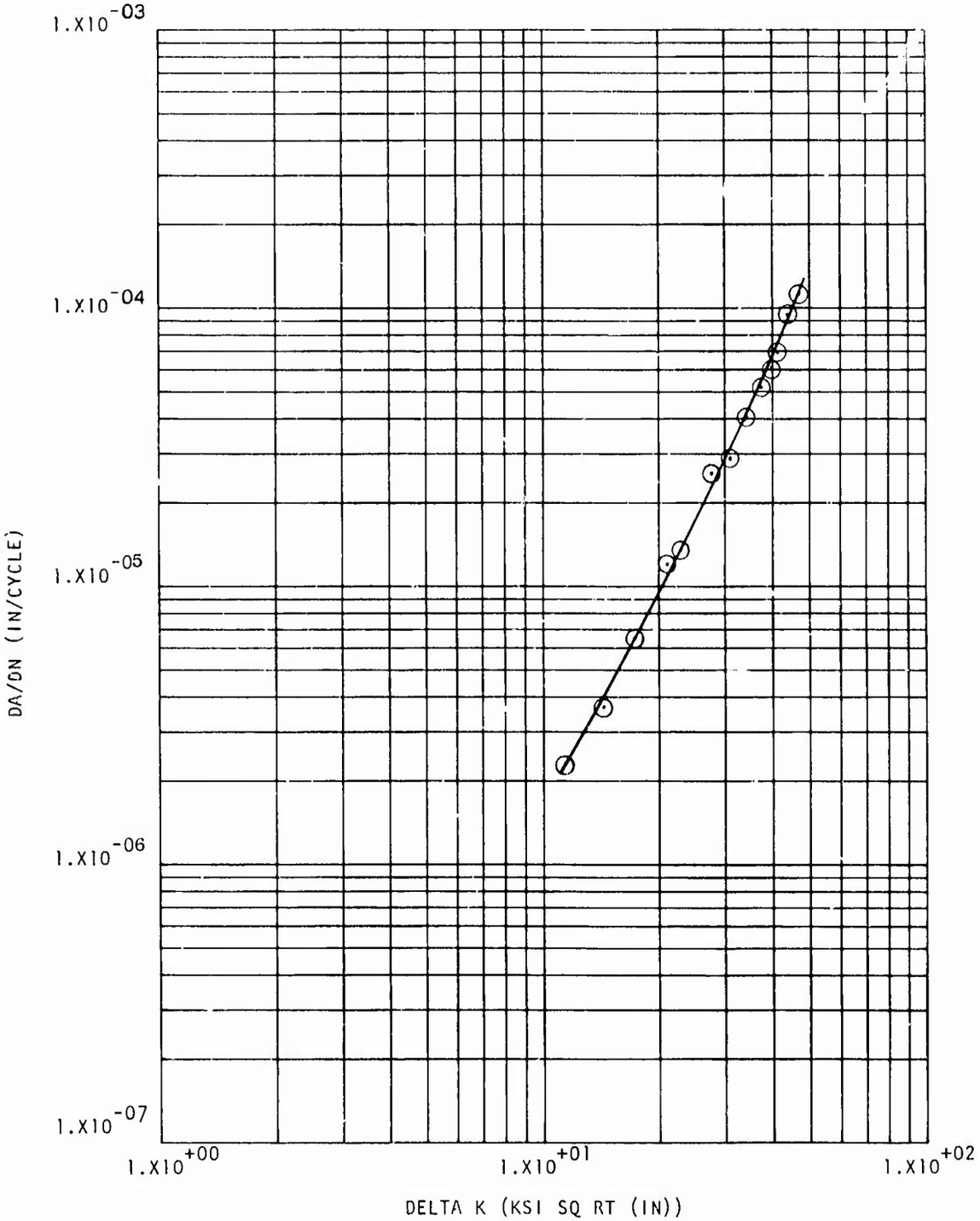
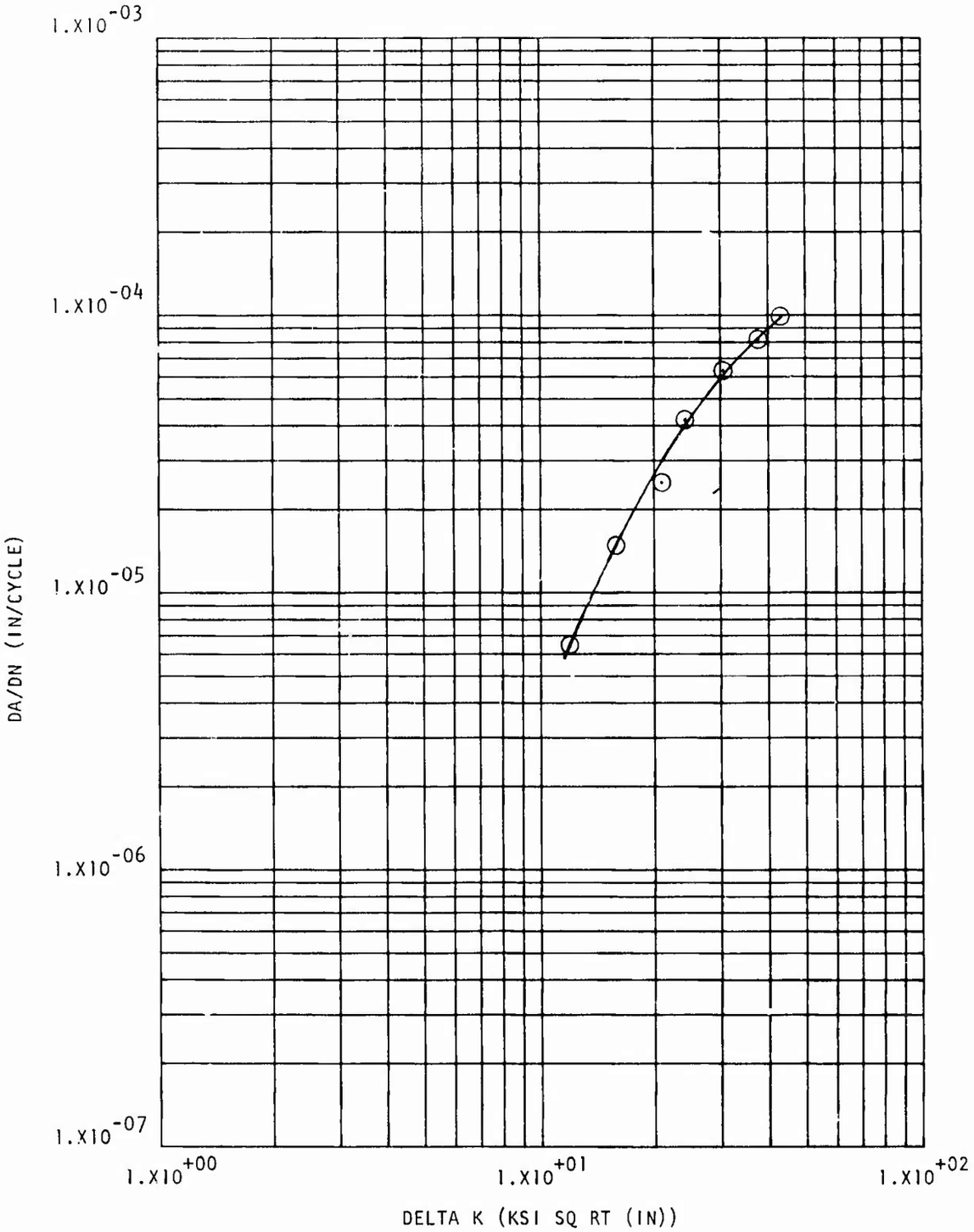


80 NWR 84-13 Ti-6Al-4V MA LHA RT R = 0.08 360 CPM



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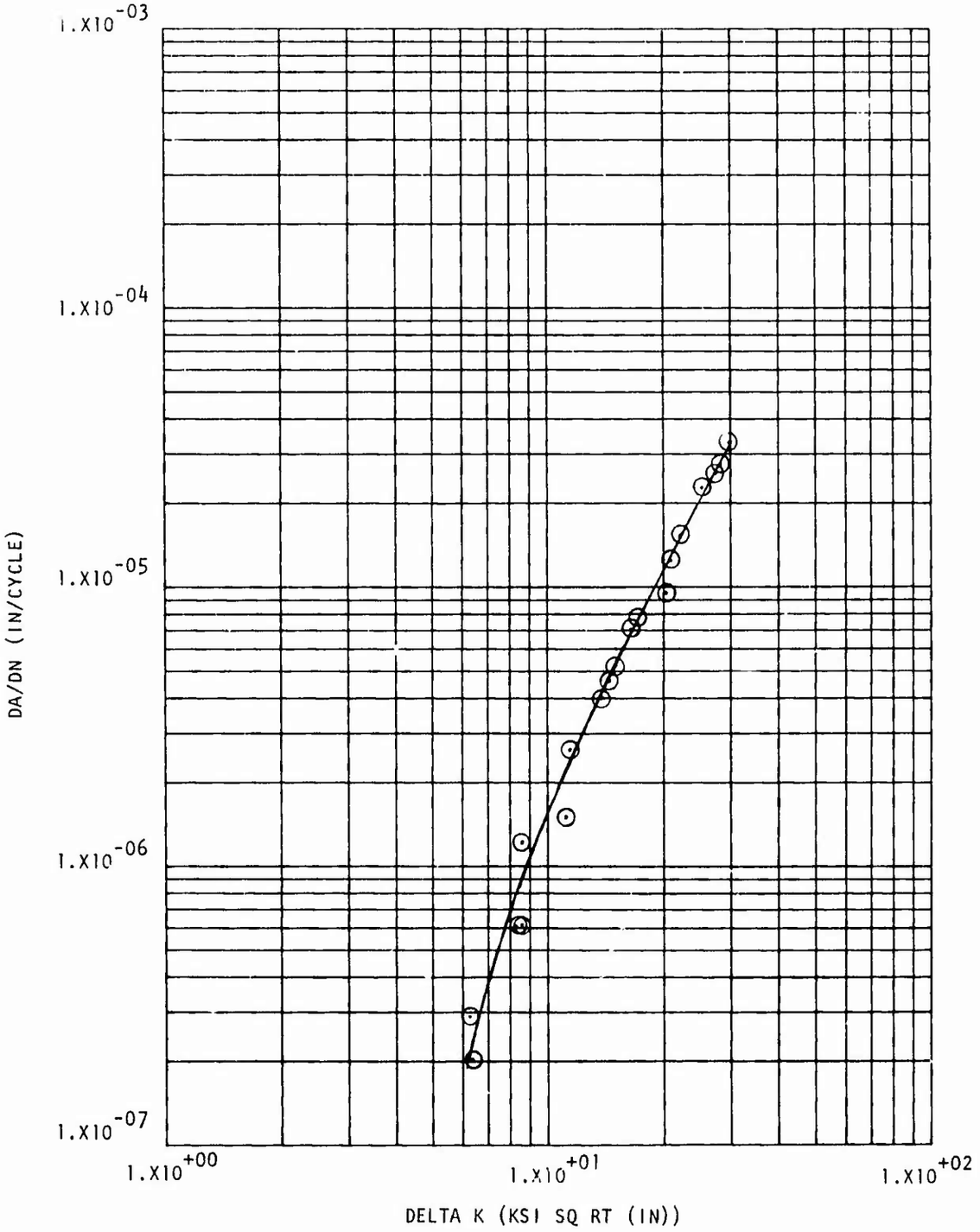
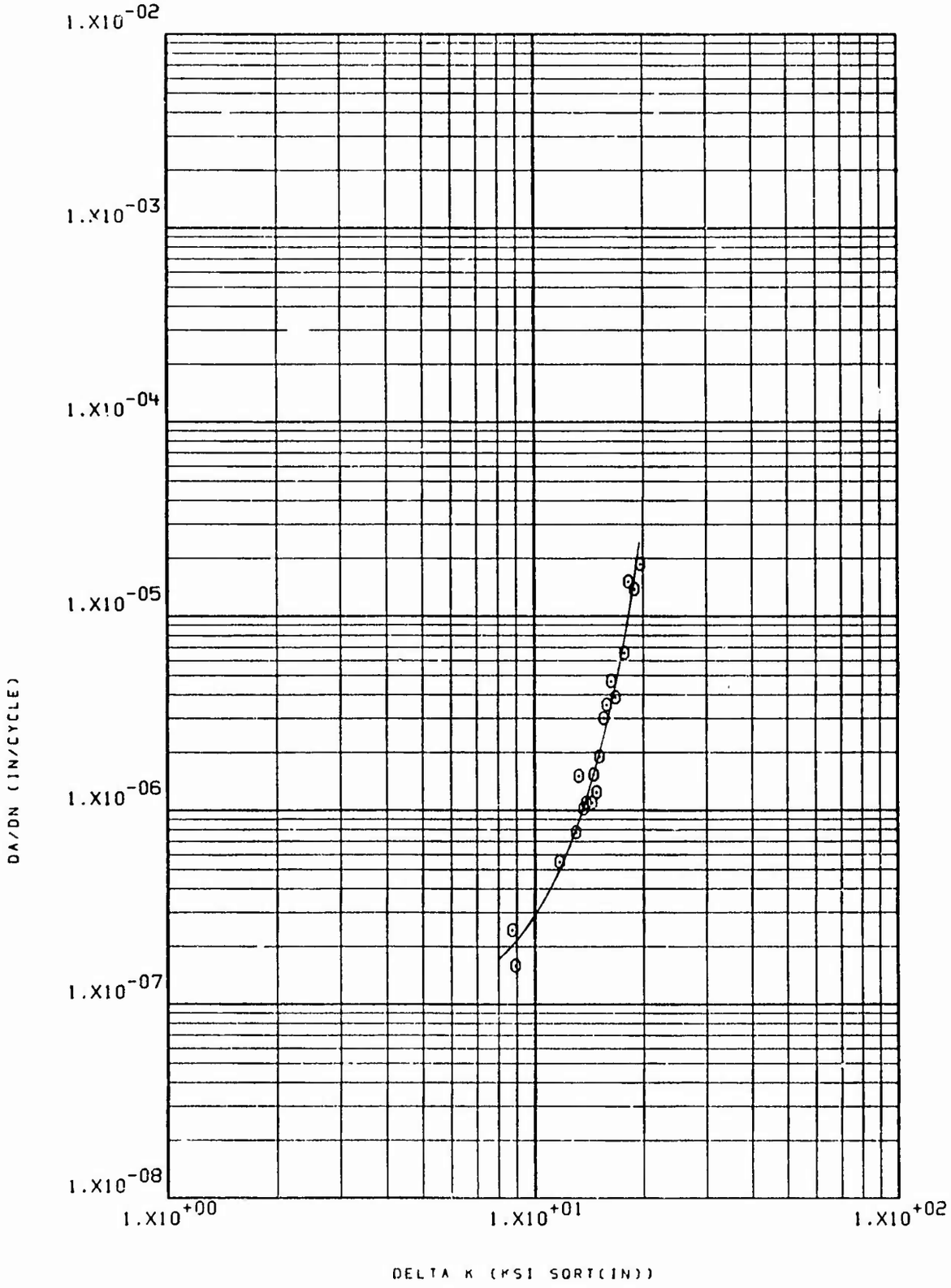
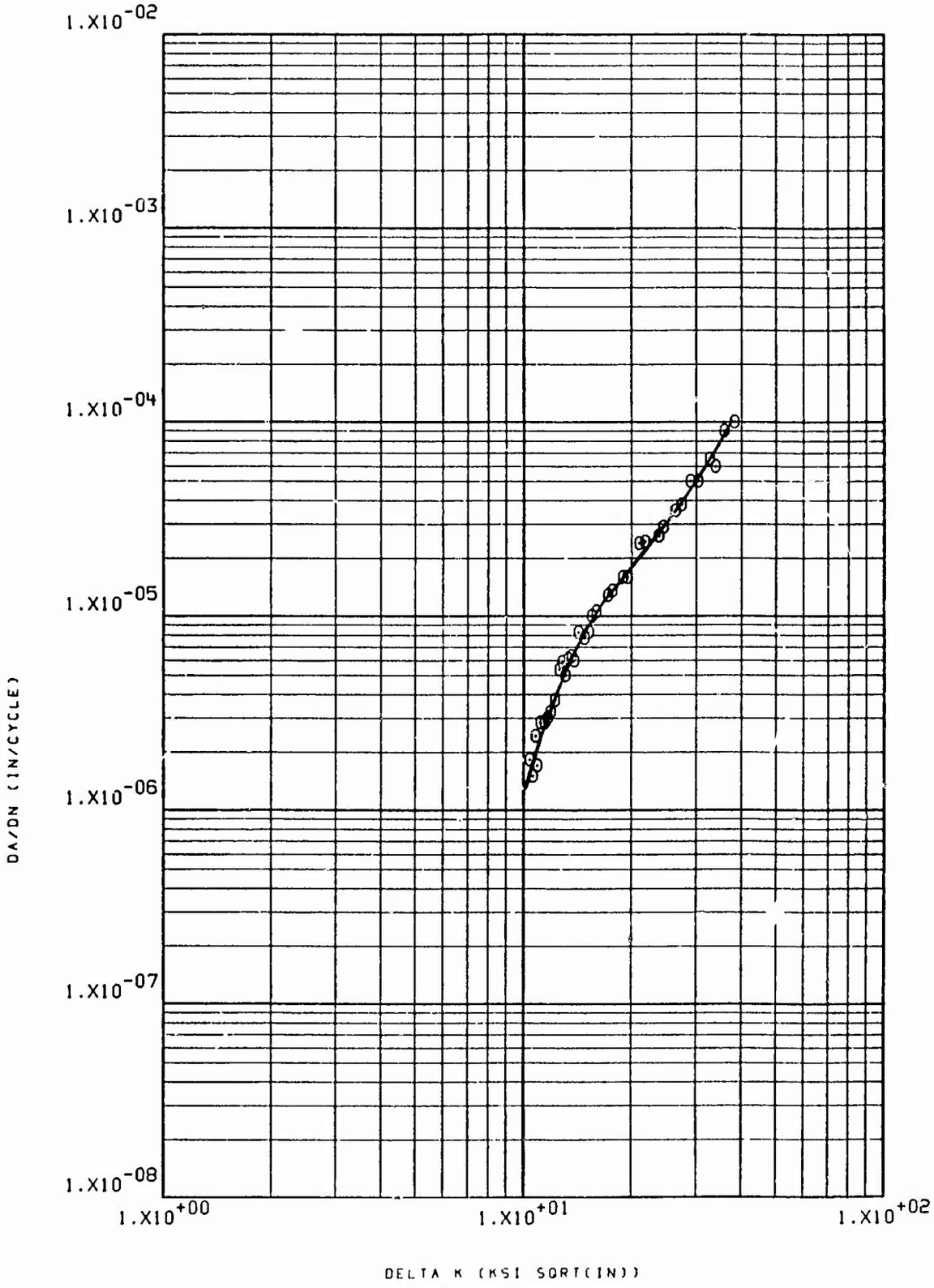


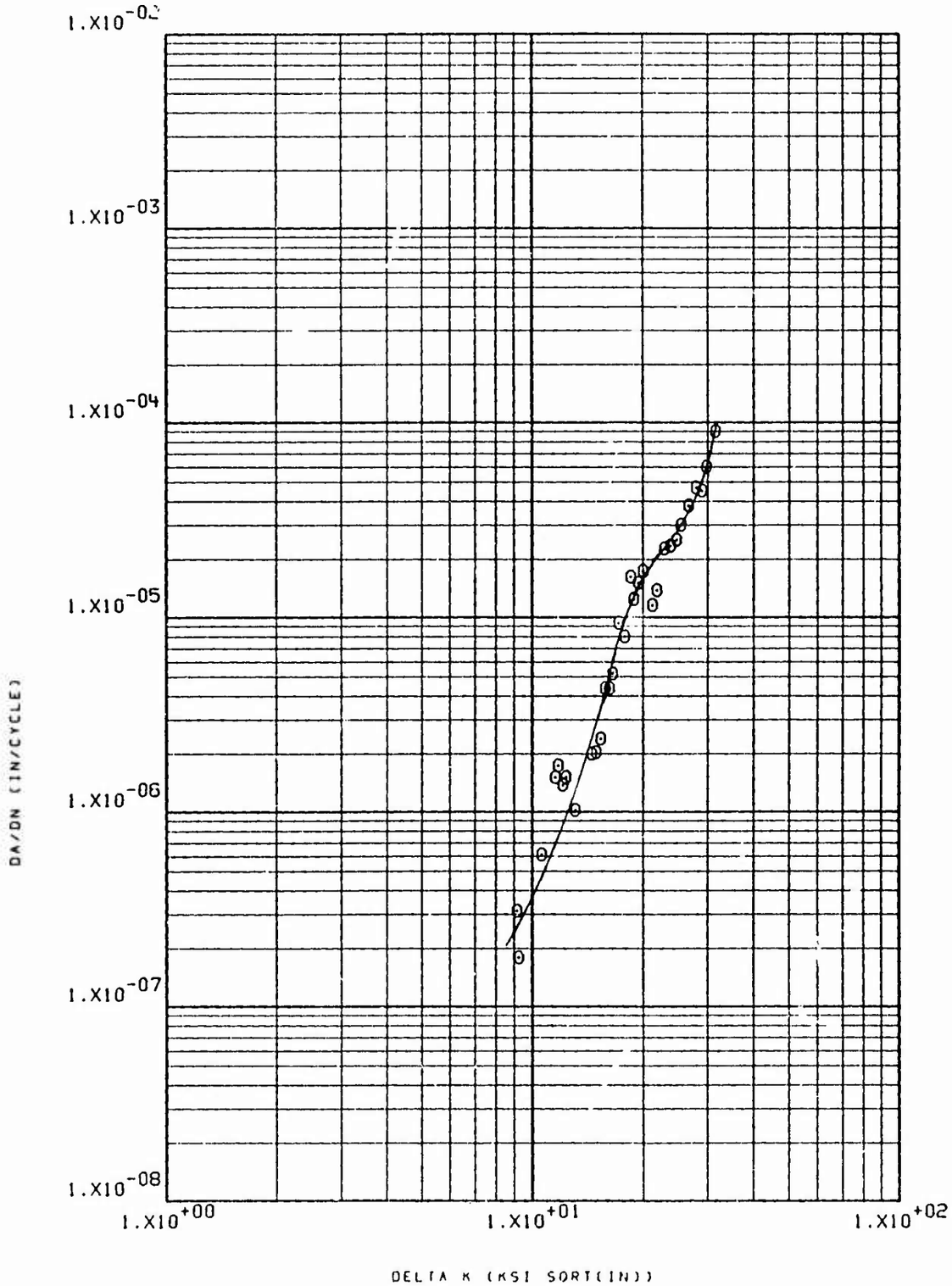
81 NRW 94-1 Ti-6Al-4V MA LHA RT R = 0.08 360 CPM



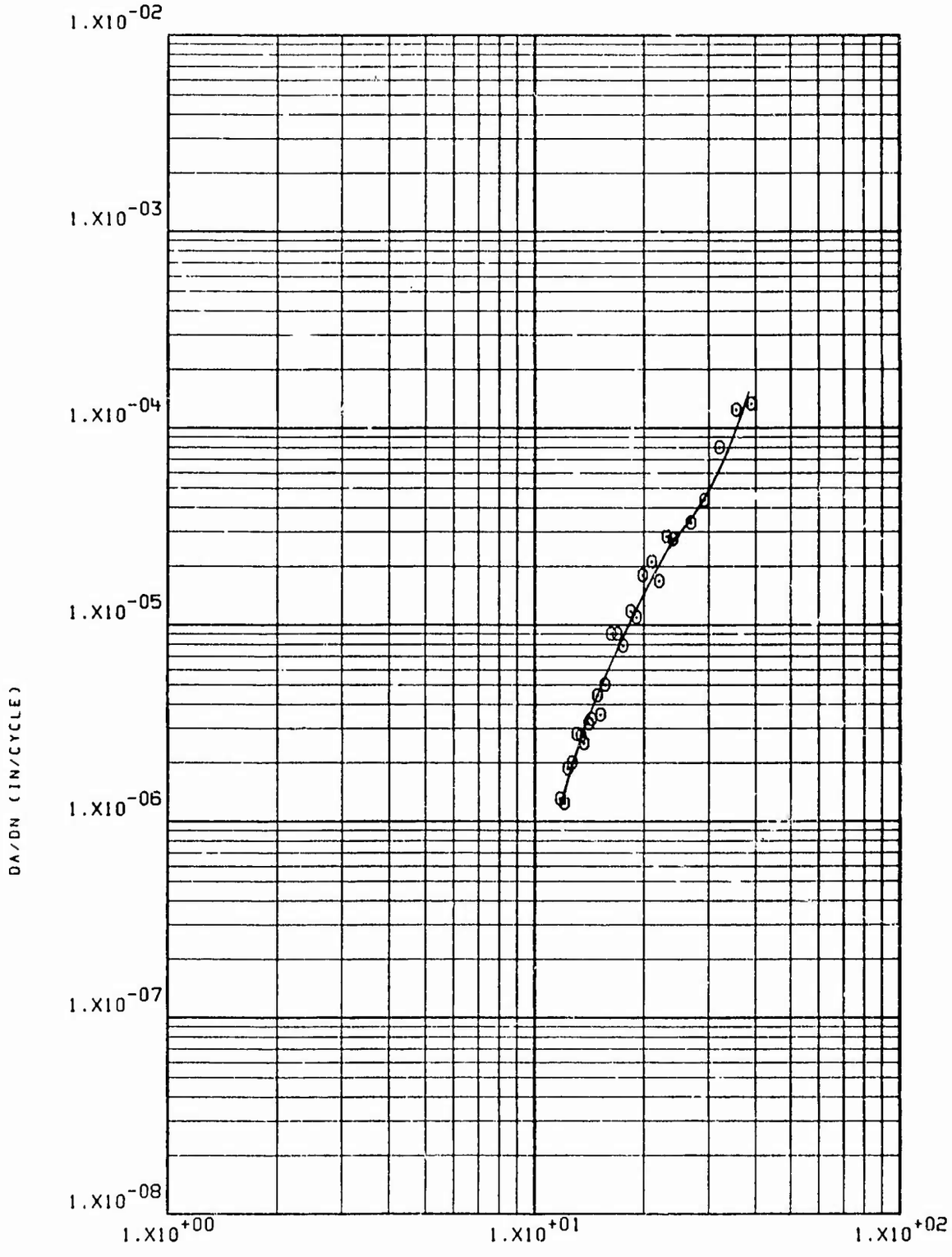
82 NPW 95-5 TI-6AL-4V RA STW RT R=.08 60CPM



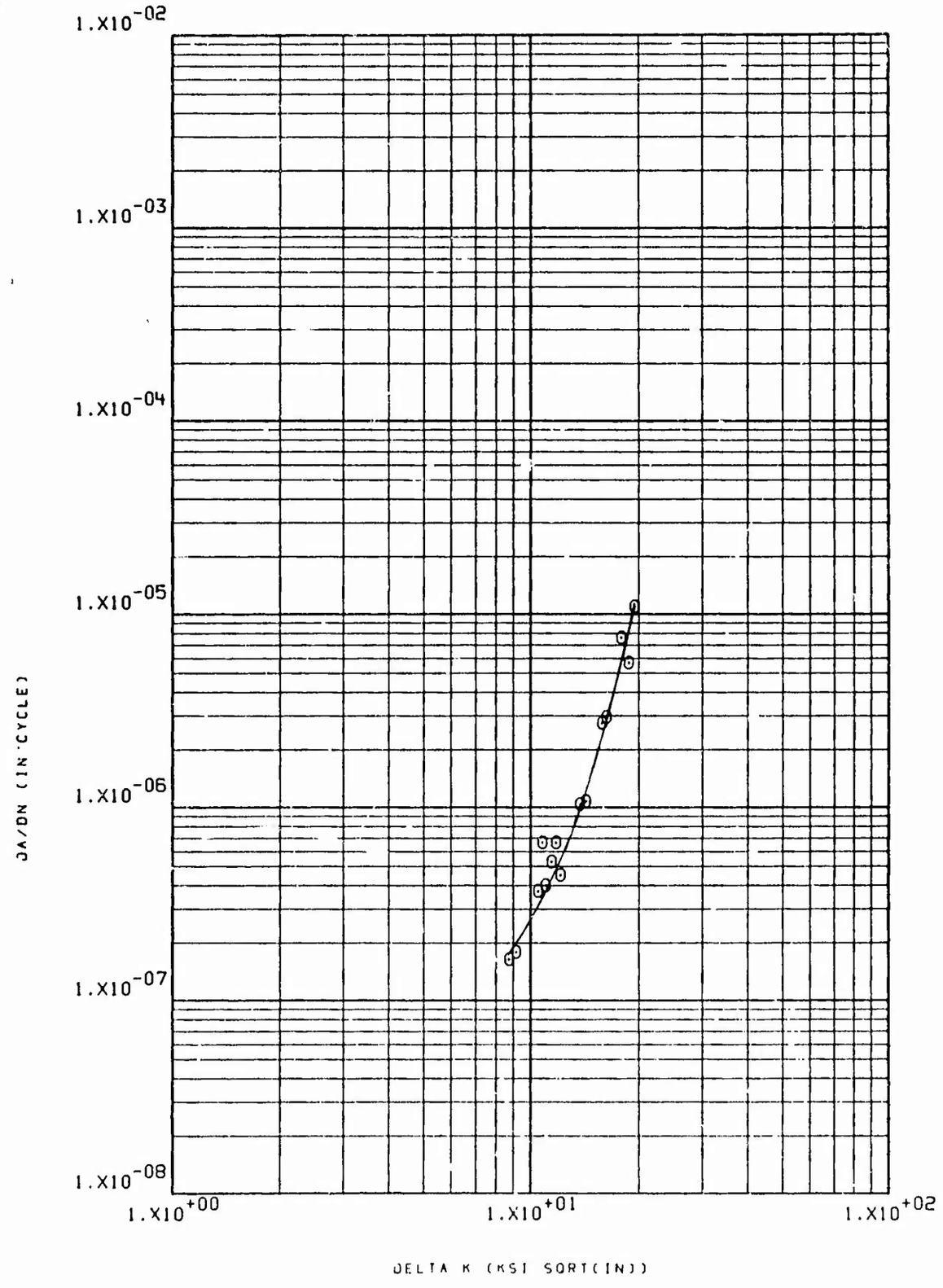
82 NWP 95-8 TI 6-4 RA HAND FORGING LHA RT R=0.5 360CPM



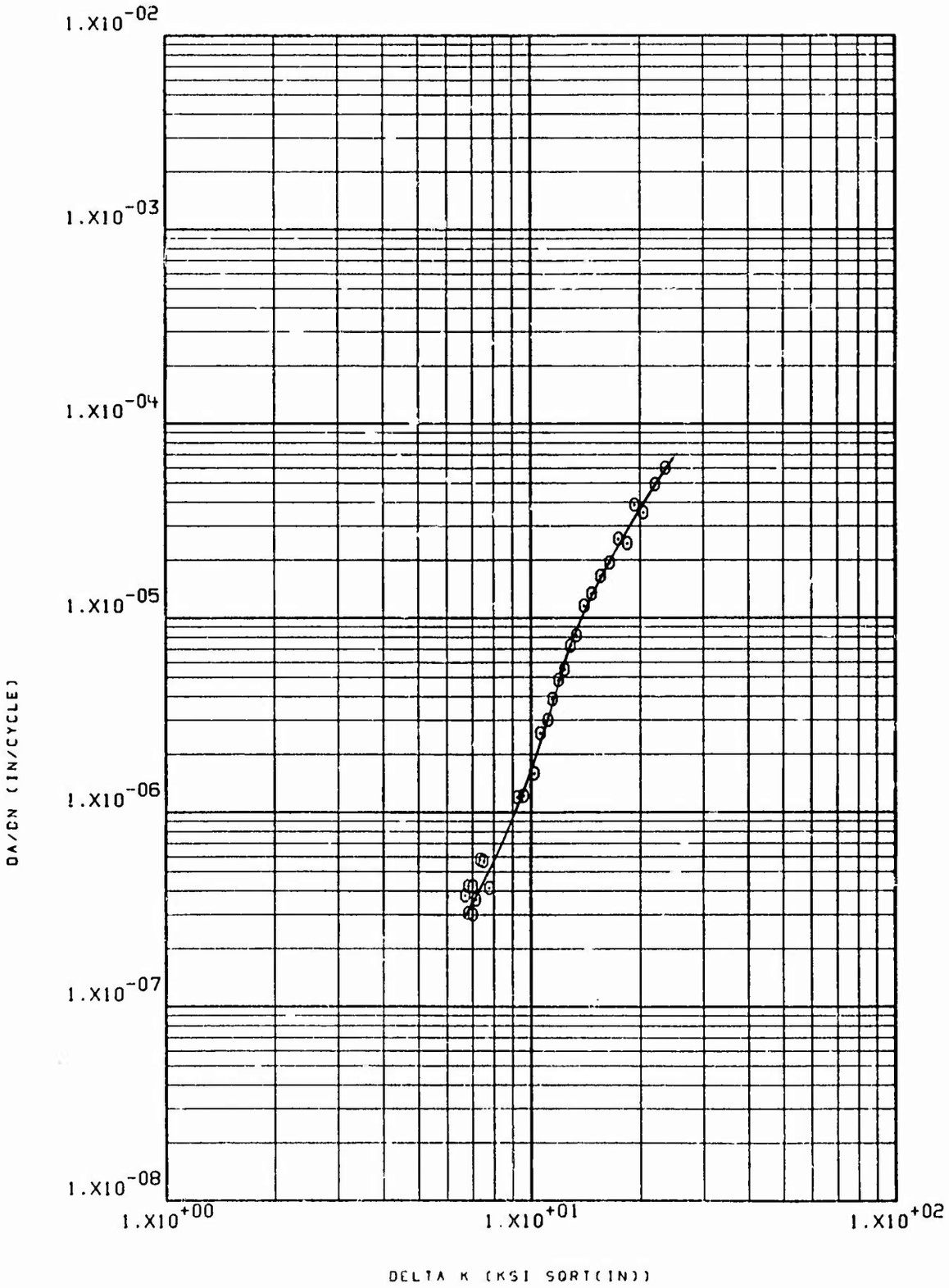
82 NWP 95-3 TI-6AL-4V RA ST# RT R=.08 60CPM



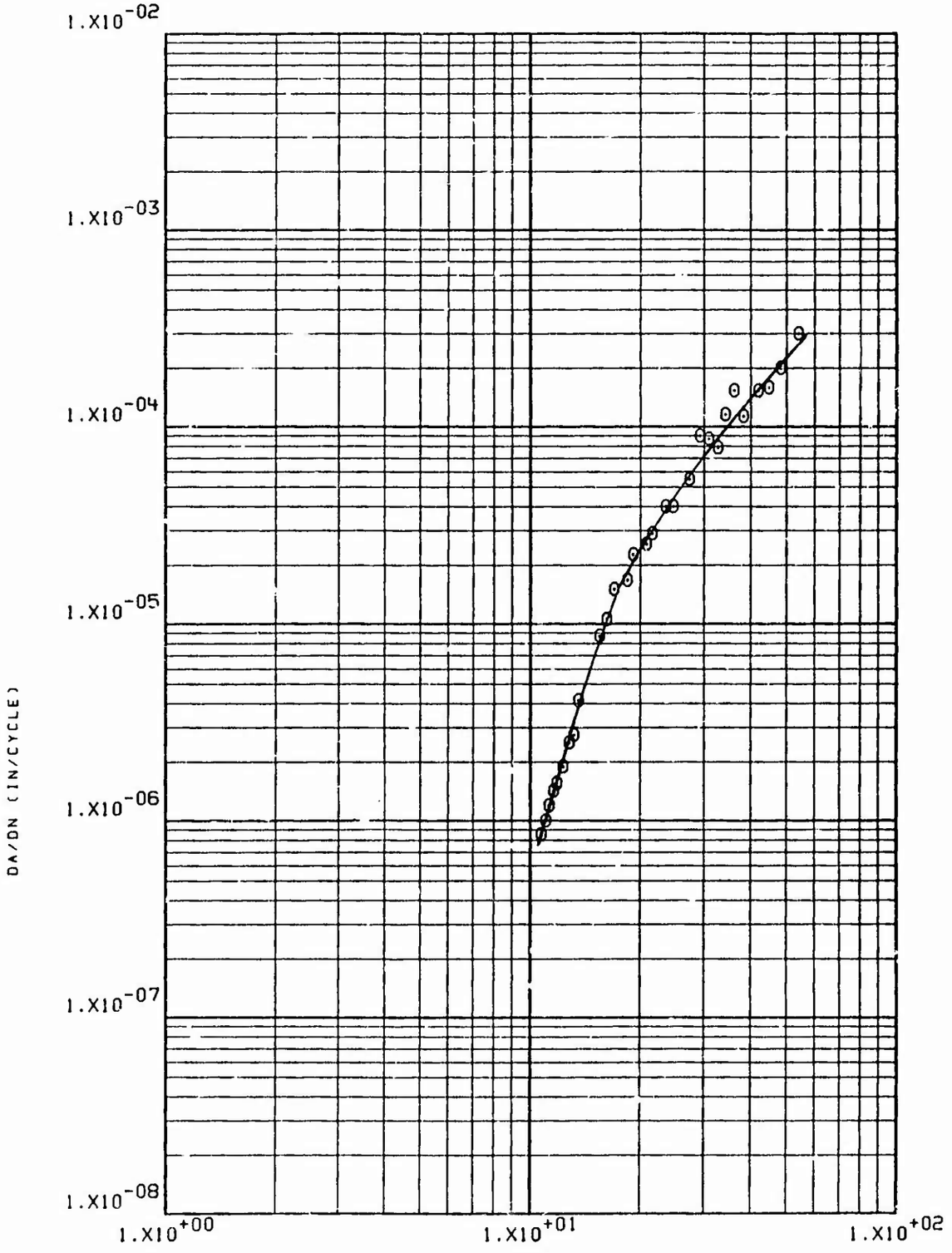
84 NWP 103-1 TI-6AL-4V RA SUMP RT P .08 60 CPM



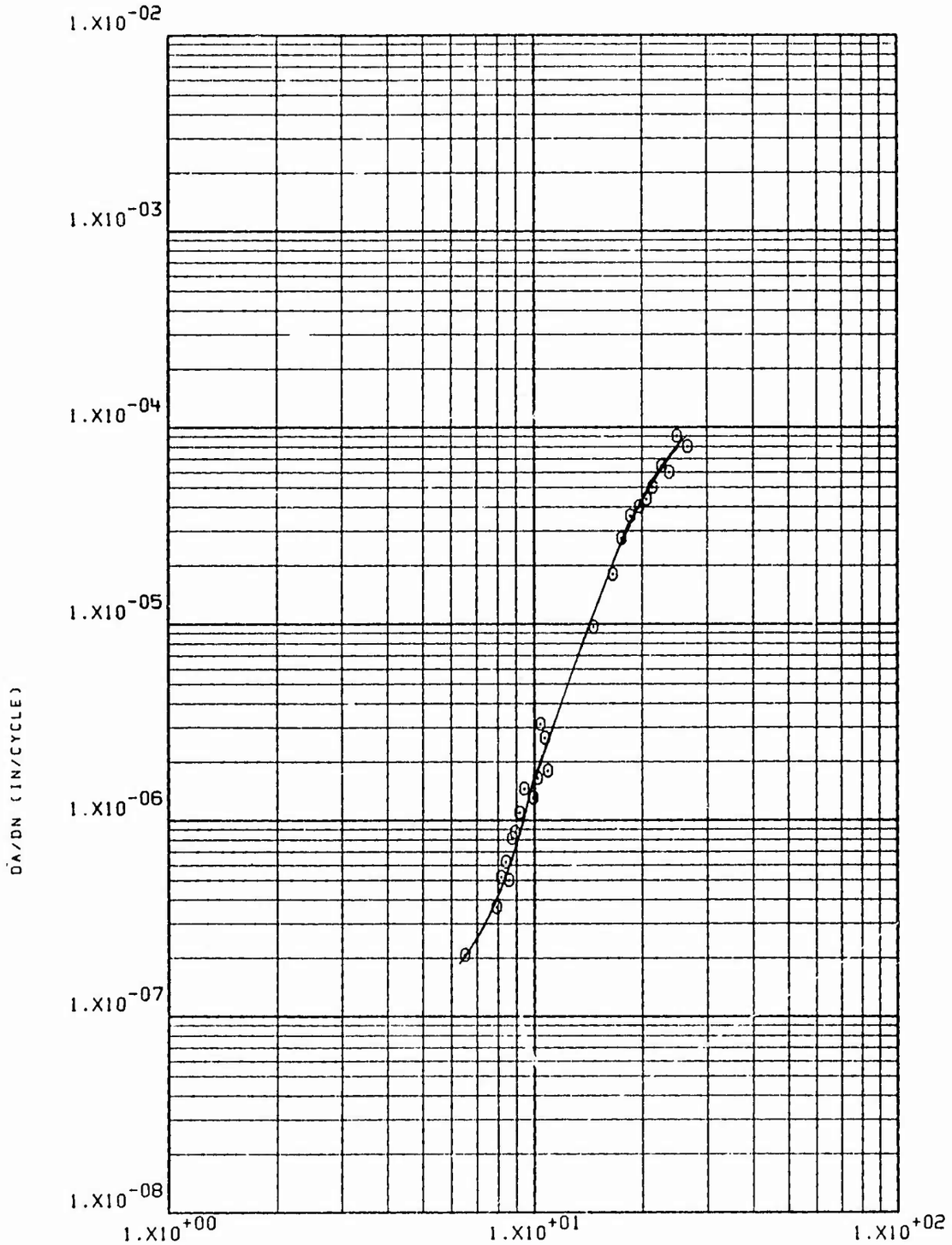
84 NPW 103 2 TI-6AL-4V RA STW RT R=.08 60CPM



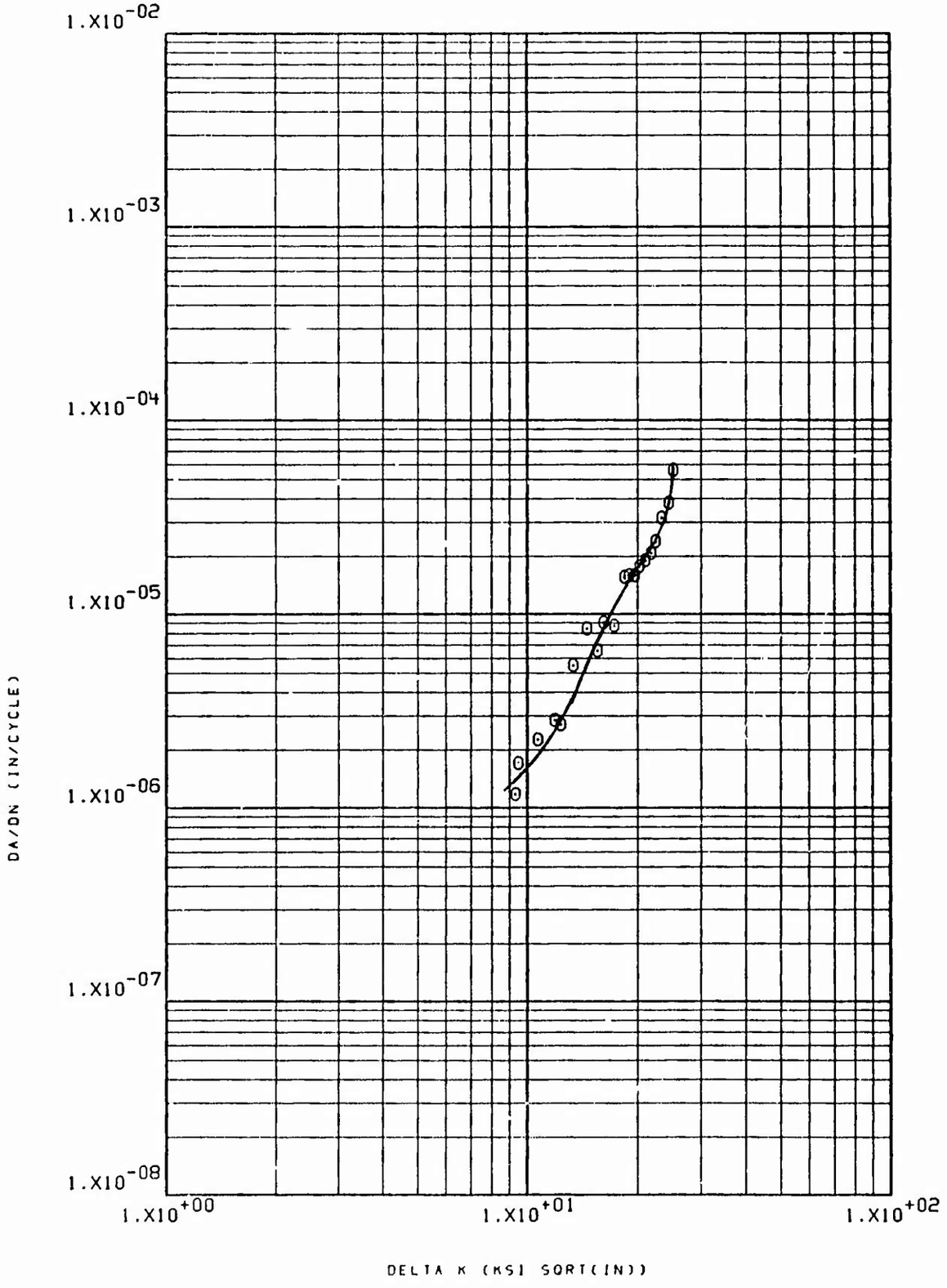
85 NP# 104-1 TI-6AL-4V RA S1# RT R=.08 60CPM



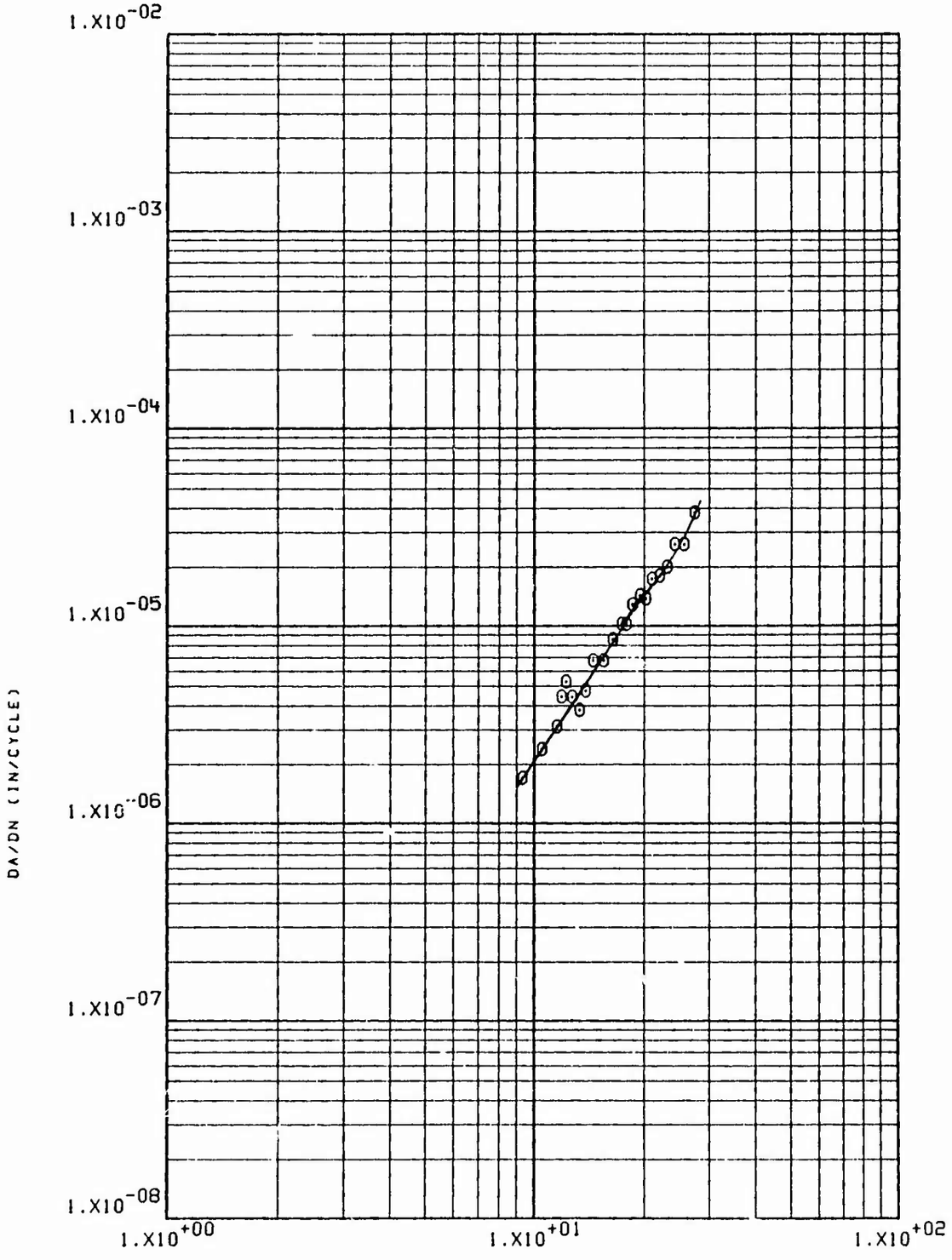
85 NWP 104-2 TI-6AL-4V RA SUMP RT R= .08 60CPM



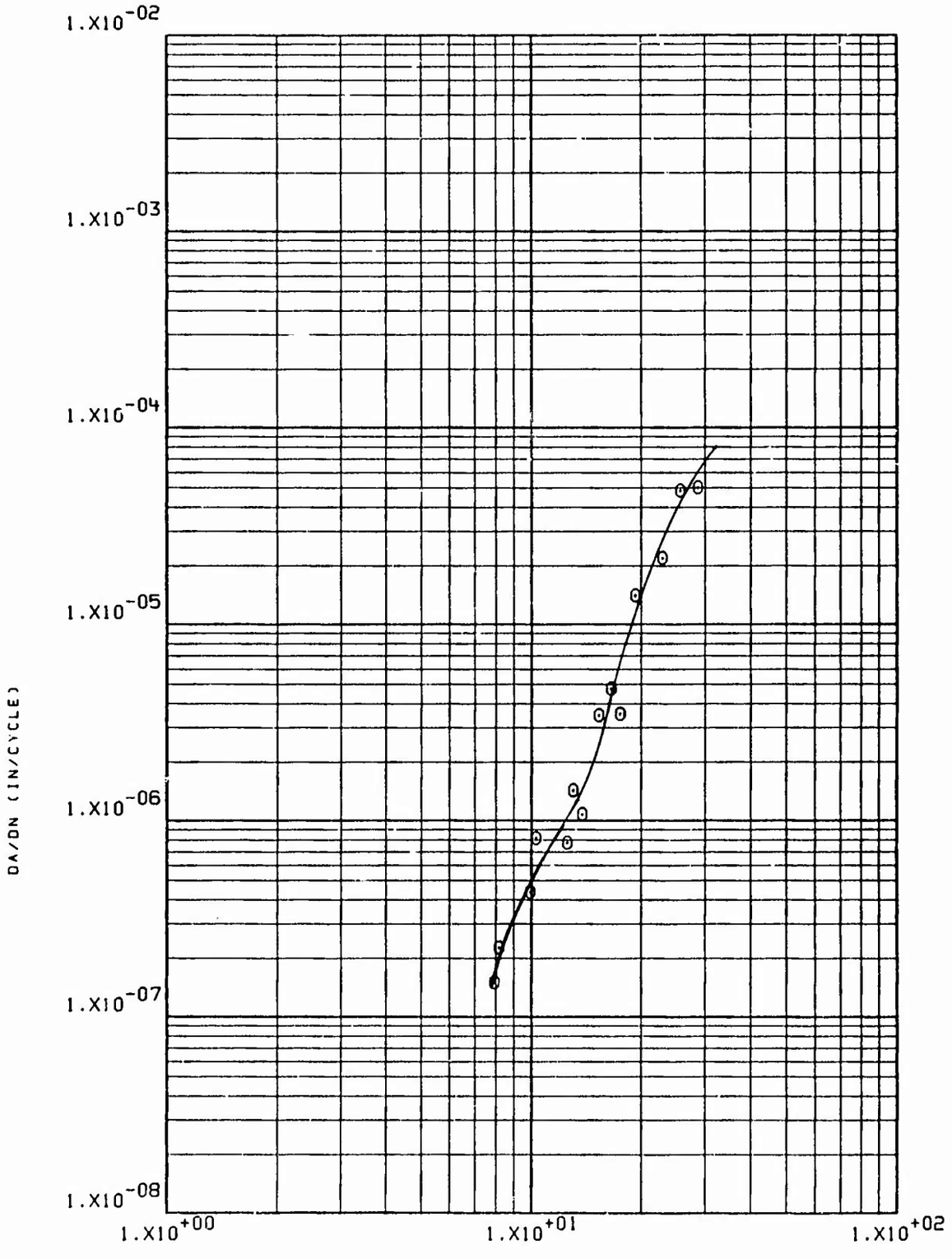
86 NWP 107-1 TI 6AL-4V RA STA RT R=.08 60CPM



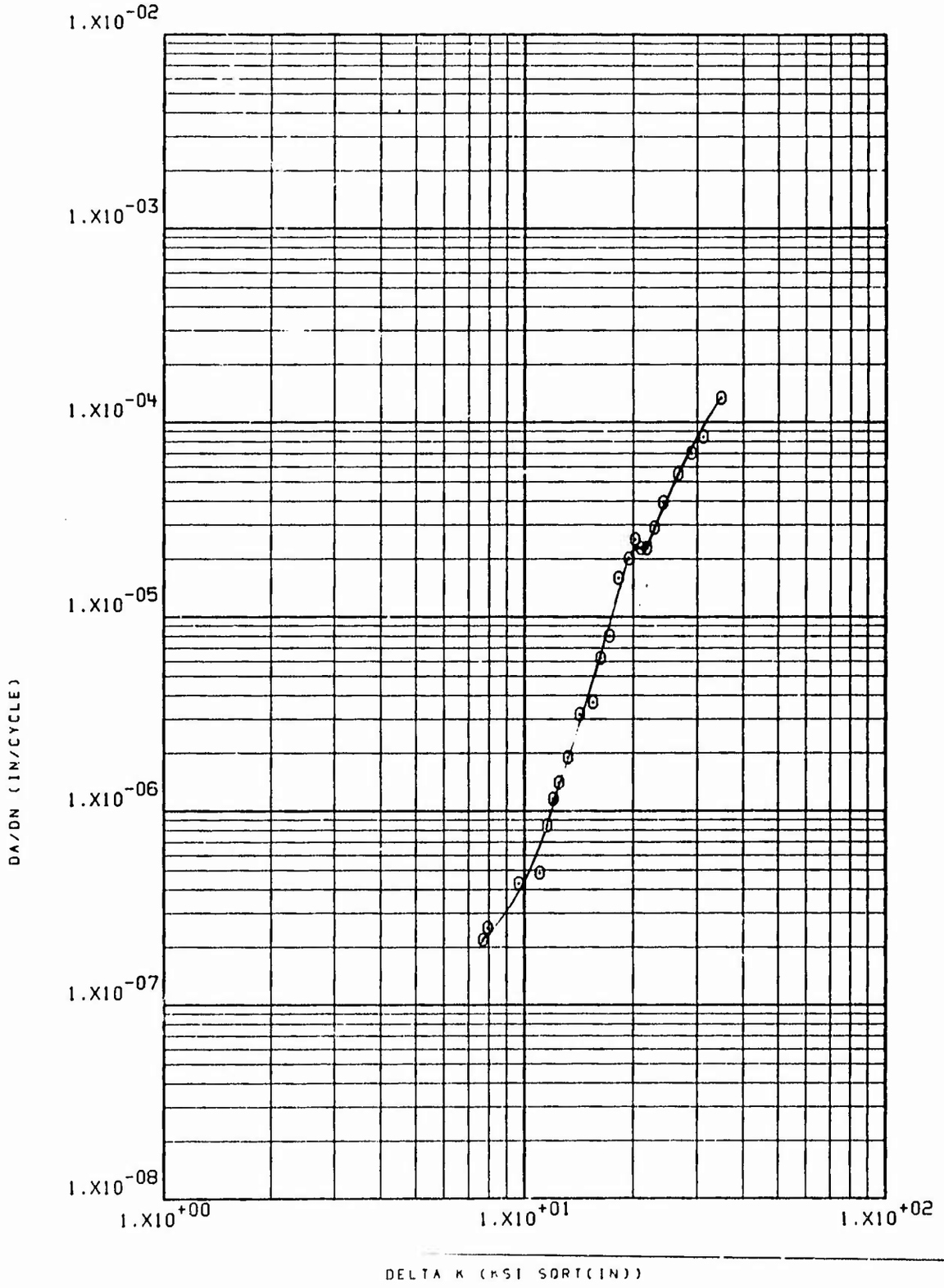
90 NPW 032A TI-6AL-4V DB(PW/PW) SUMP RT 60CPM R=.08



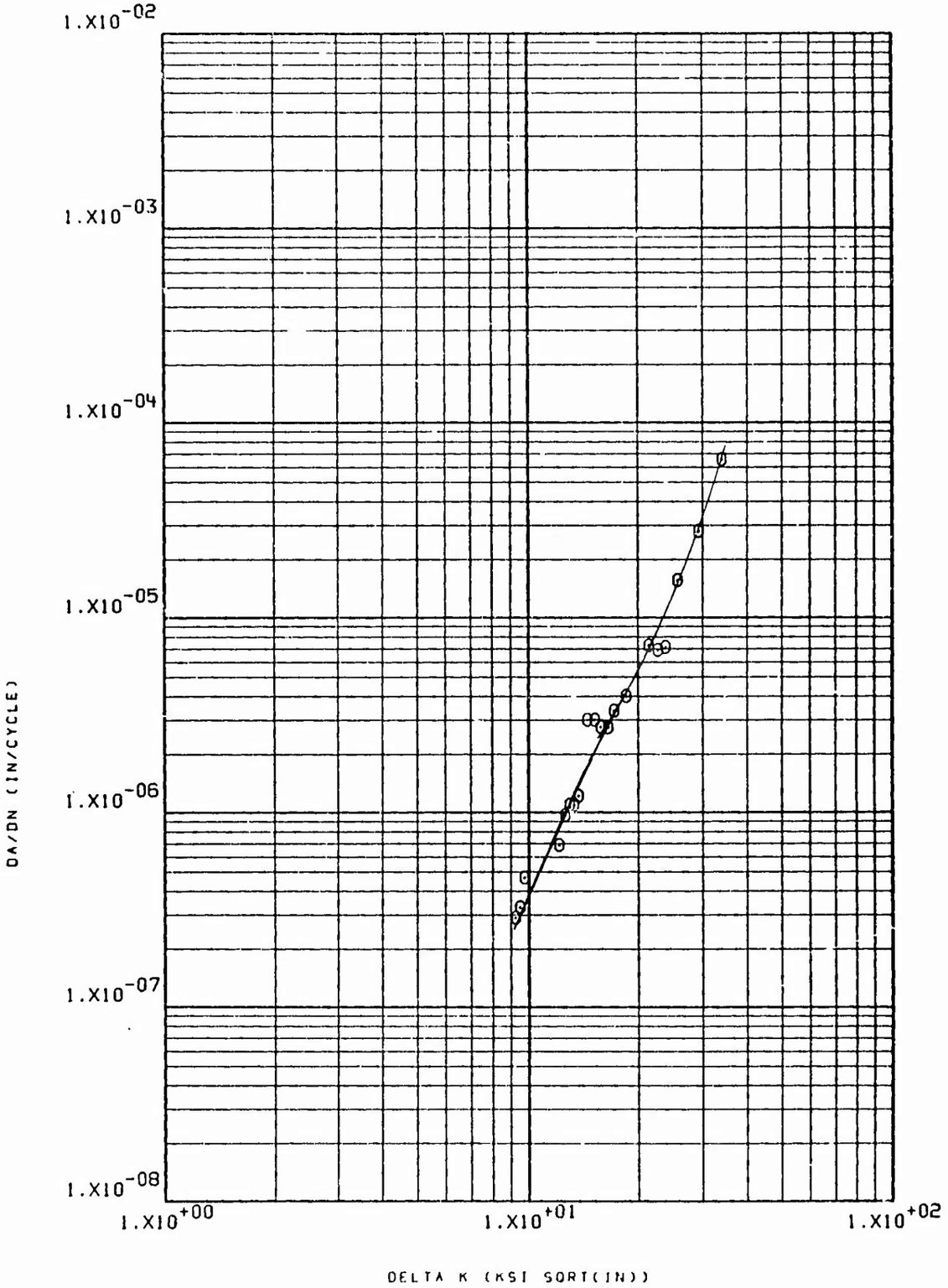
NWR 032D TI-6AL-4V DB(WR/WR) STW RT 60CPM R=.08



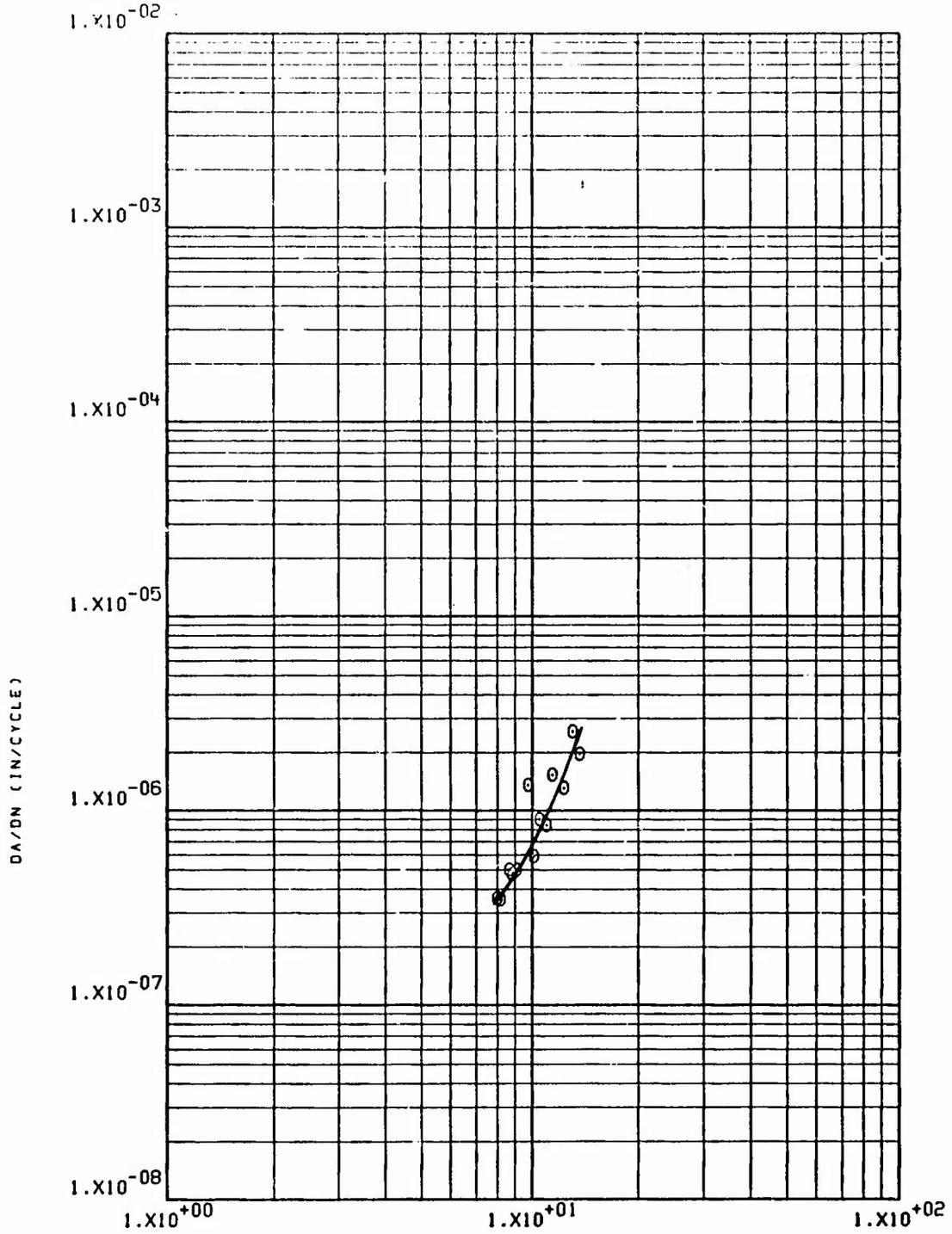
253 HRW 10-20 TI 6AL-4V RA STW RT R=.08 60CPM



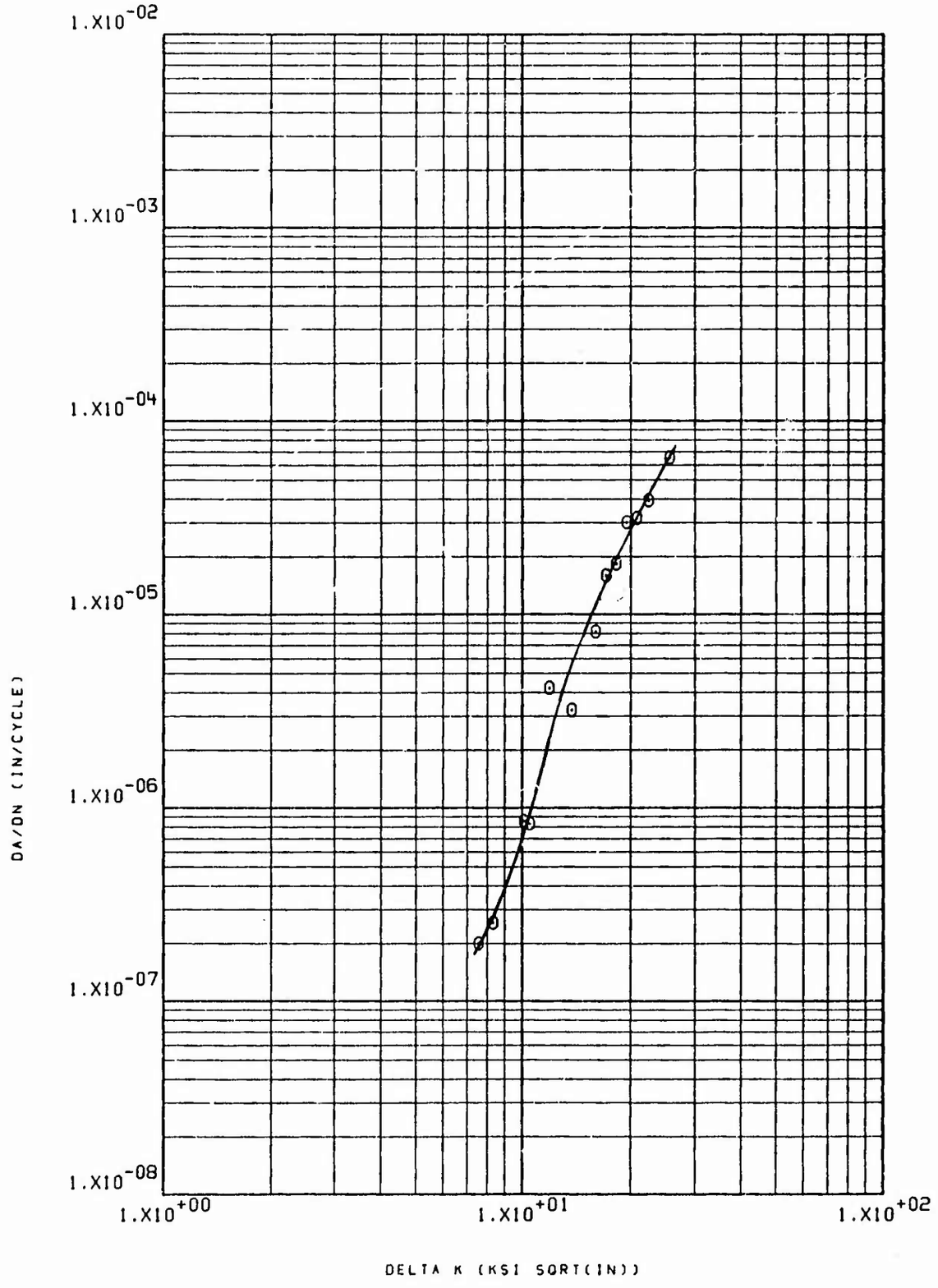
294 NRW 1022 TI 6AL-4V RM RA STW RT R=.03 60CPM



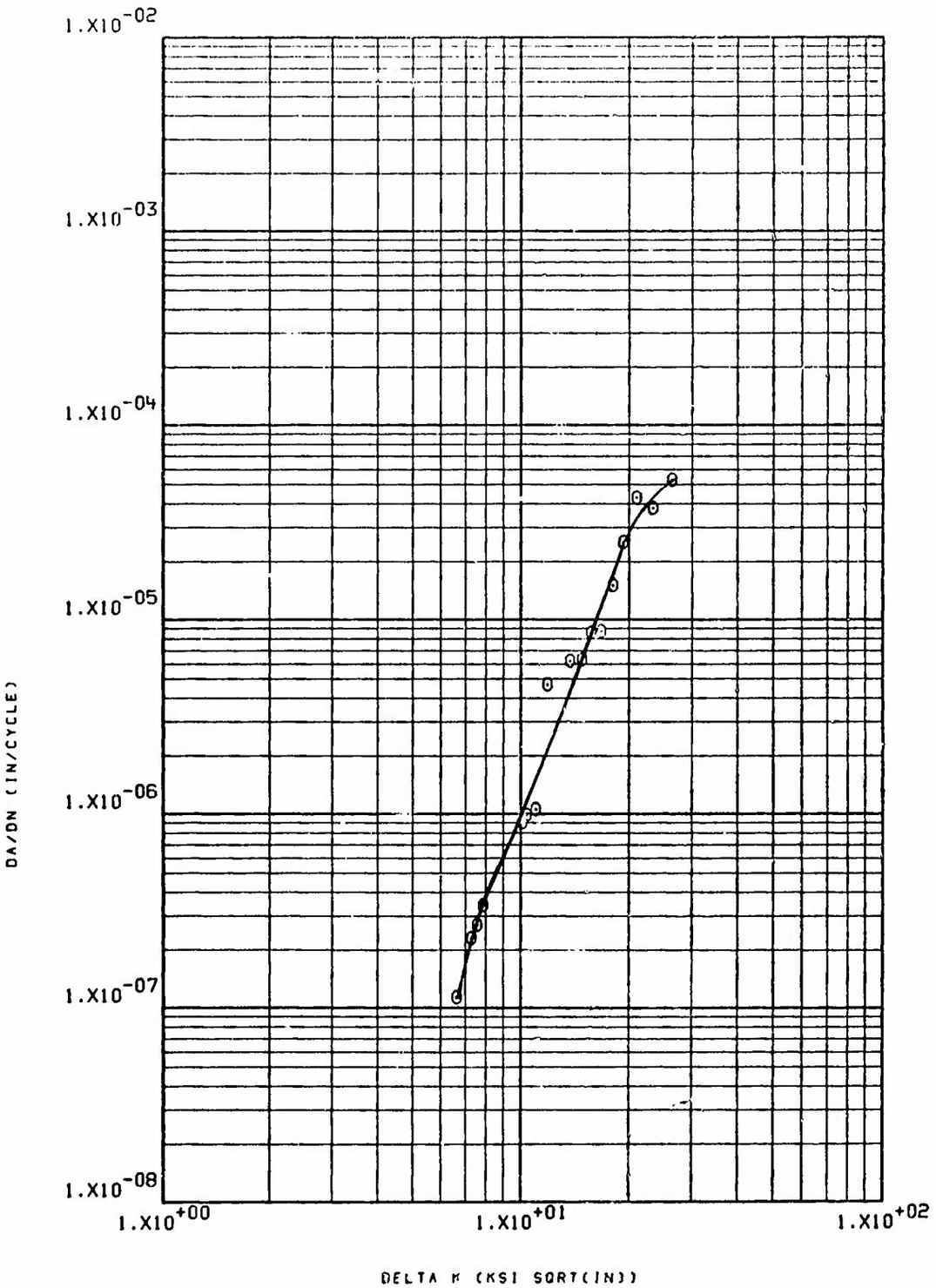
7406 NRW 101EA TI 6AL-4V RA SUMP RT R .08 60CPM



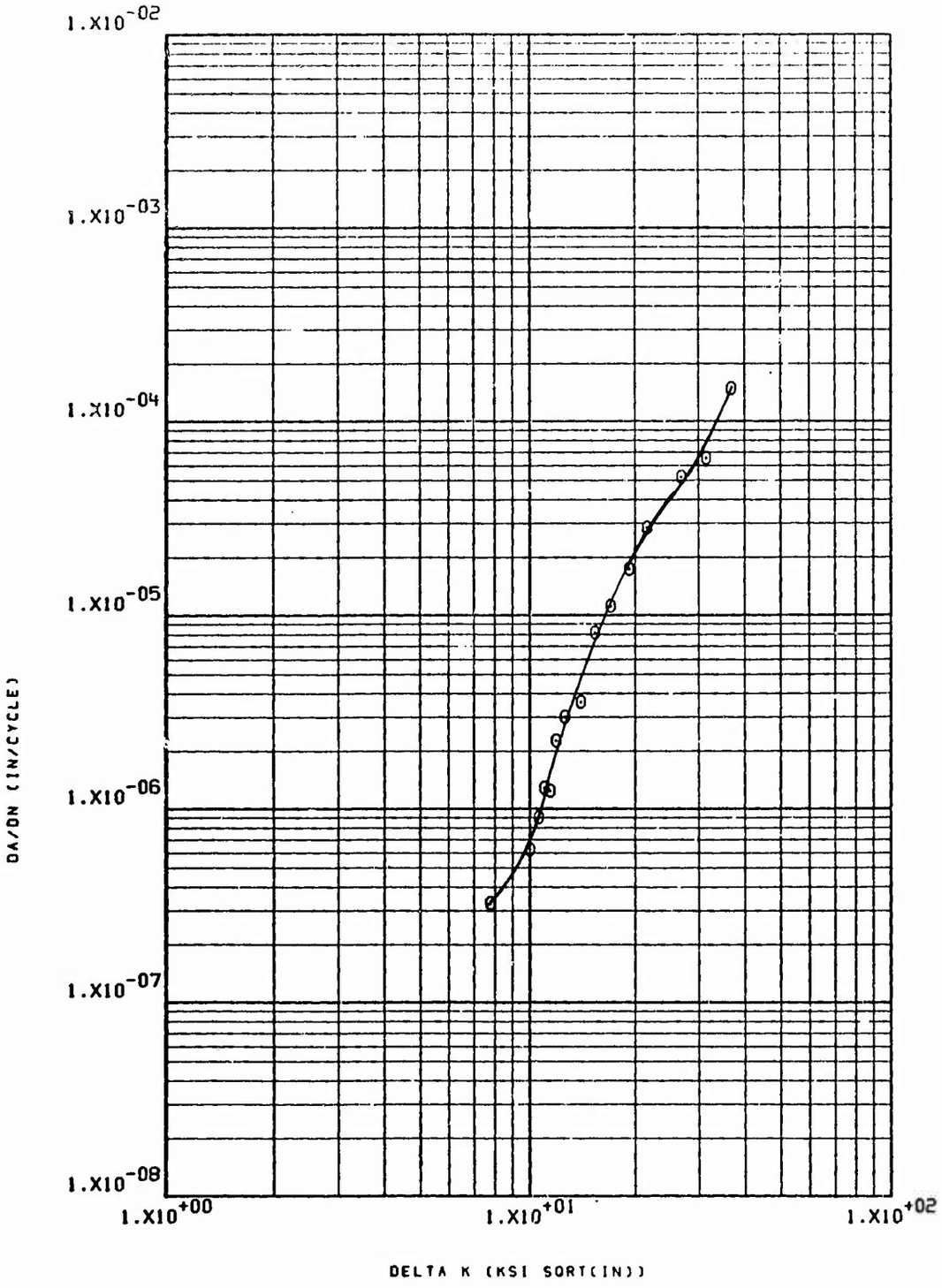
7768 NRW 1017A TI-6AL-4V RA STW RT R=0.08 60CPM



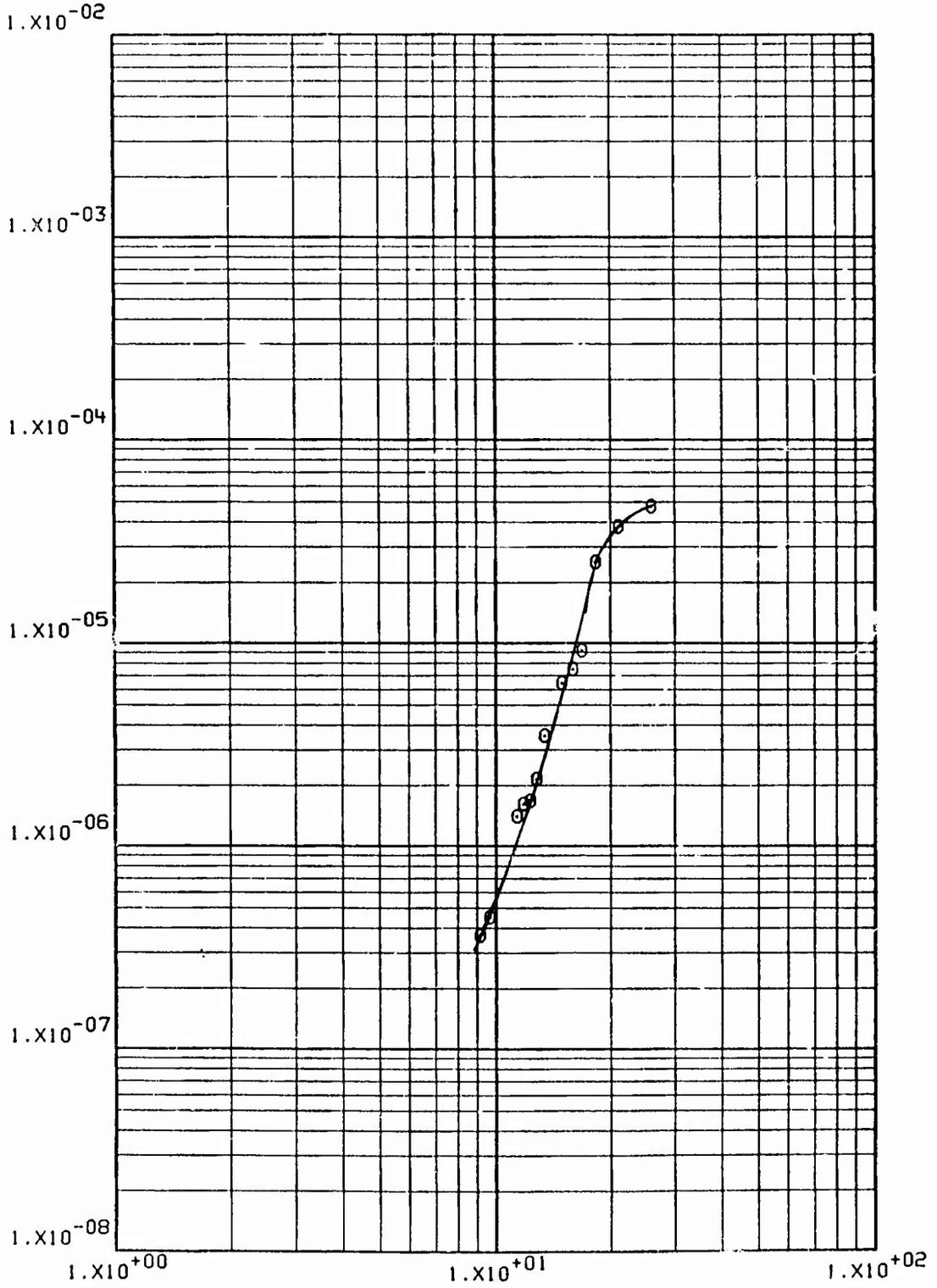
L1200021 N-I TI-6AL-4V SUMP RT R=.08 60CPM



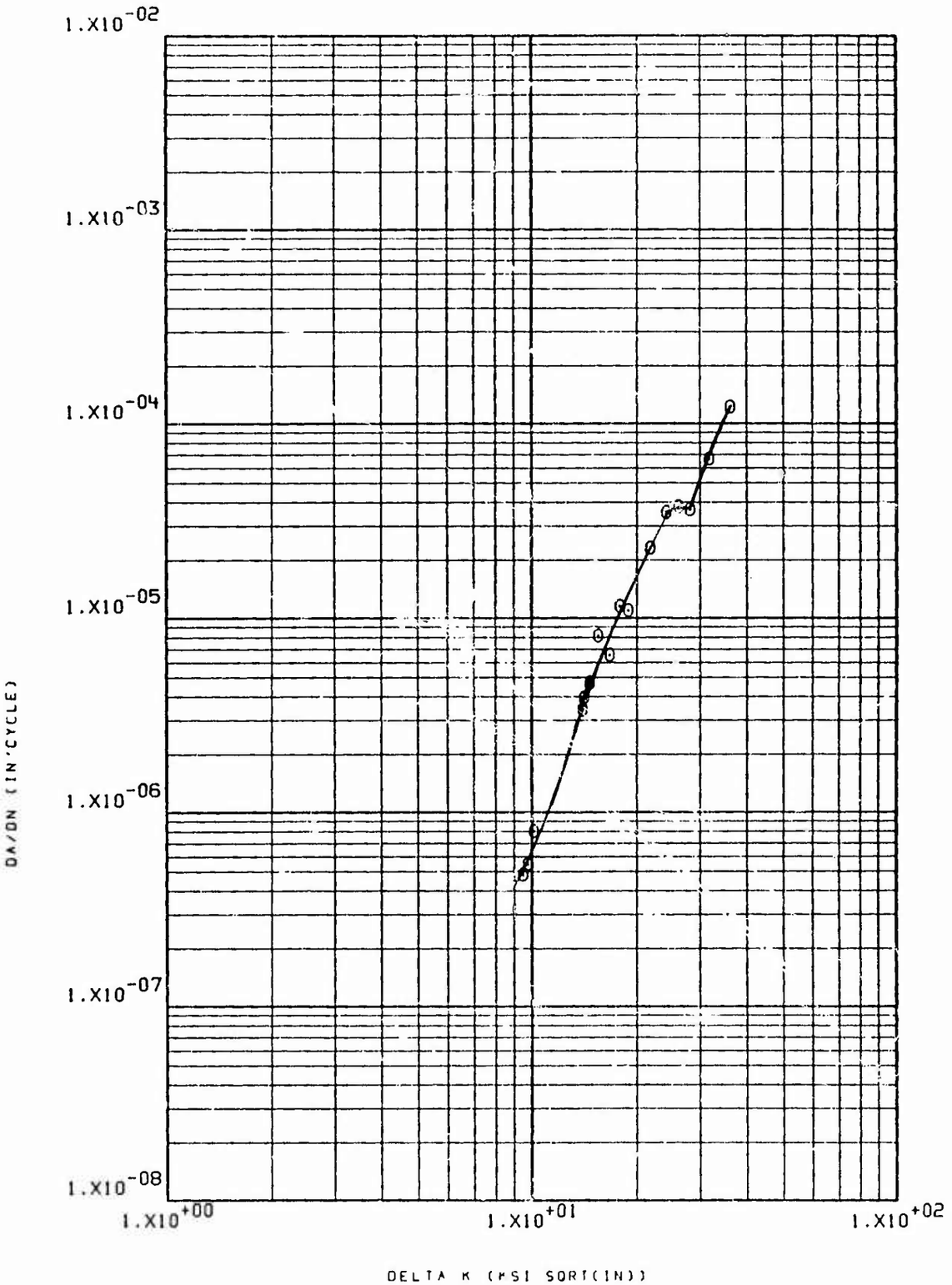
LI 200021 N-2 TI-6AL-4V STW RT R=0.08 60CPM



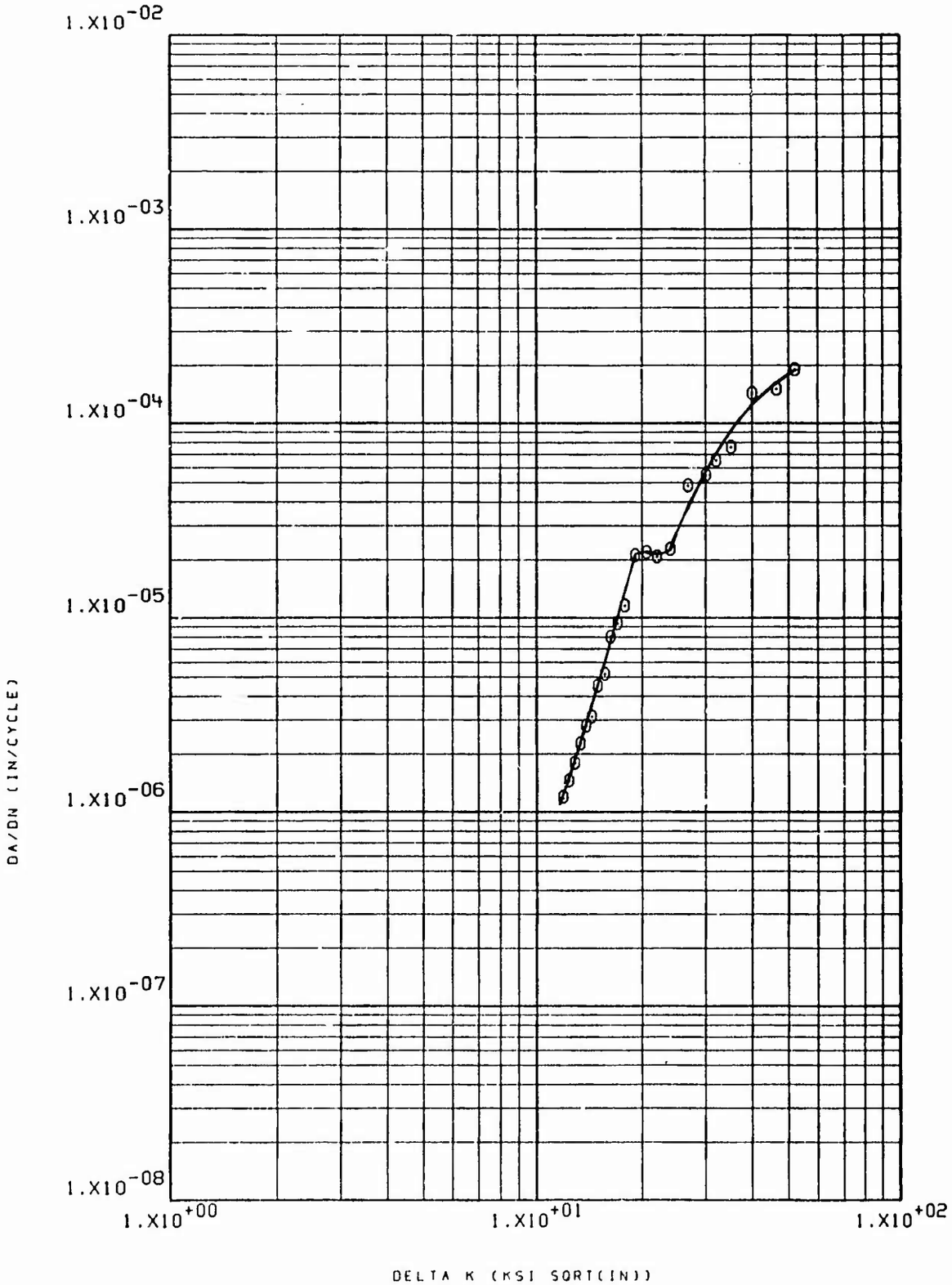
LI 200021 0-3 TI-6AL-4V STW RT R=0.08 60CPM



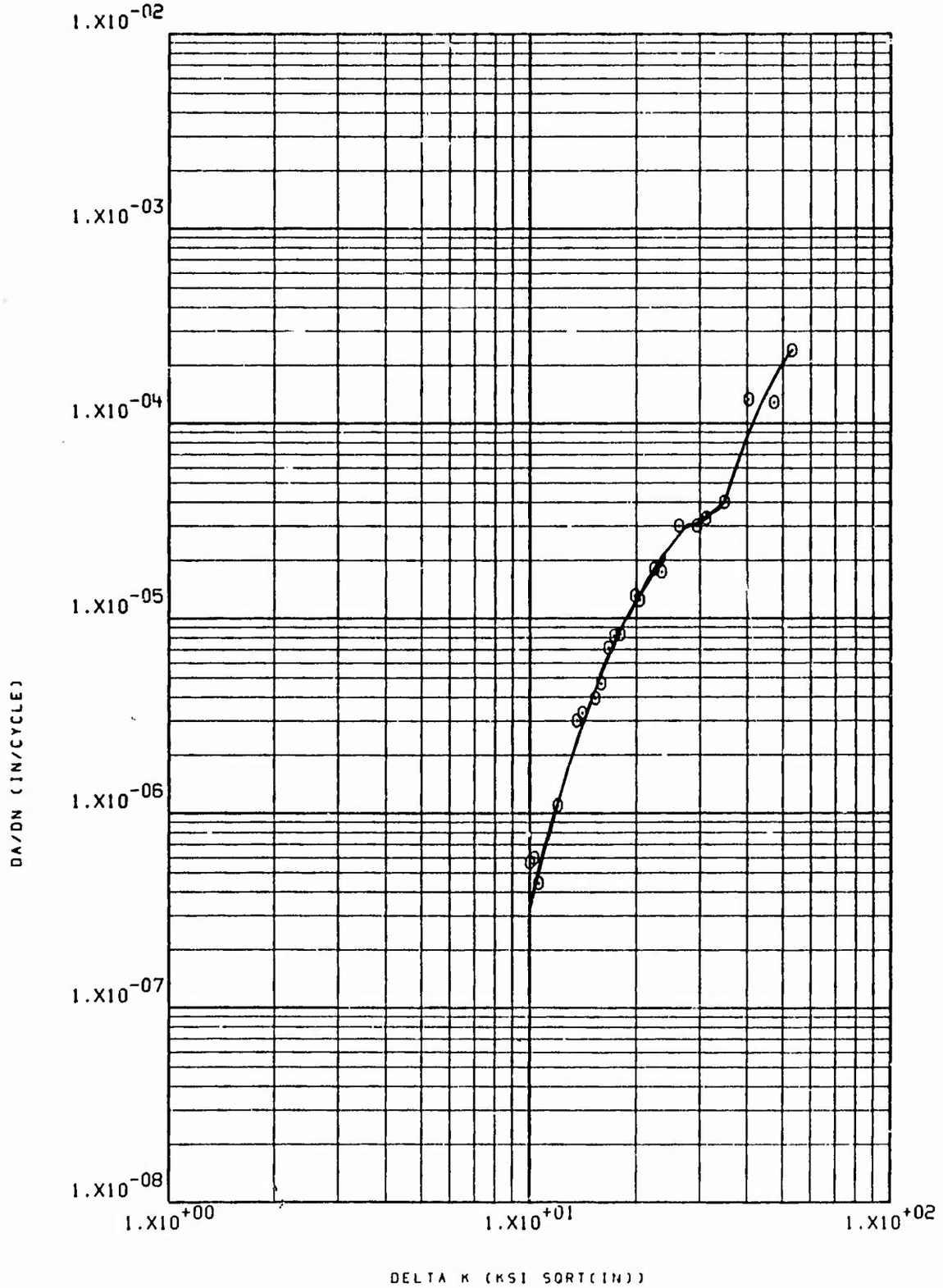
L1200021 0.4 TI-6AL-4V SUMP RT R=.08 60CPM



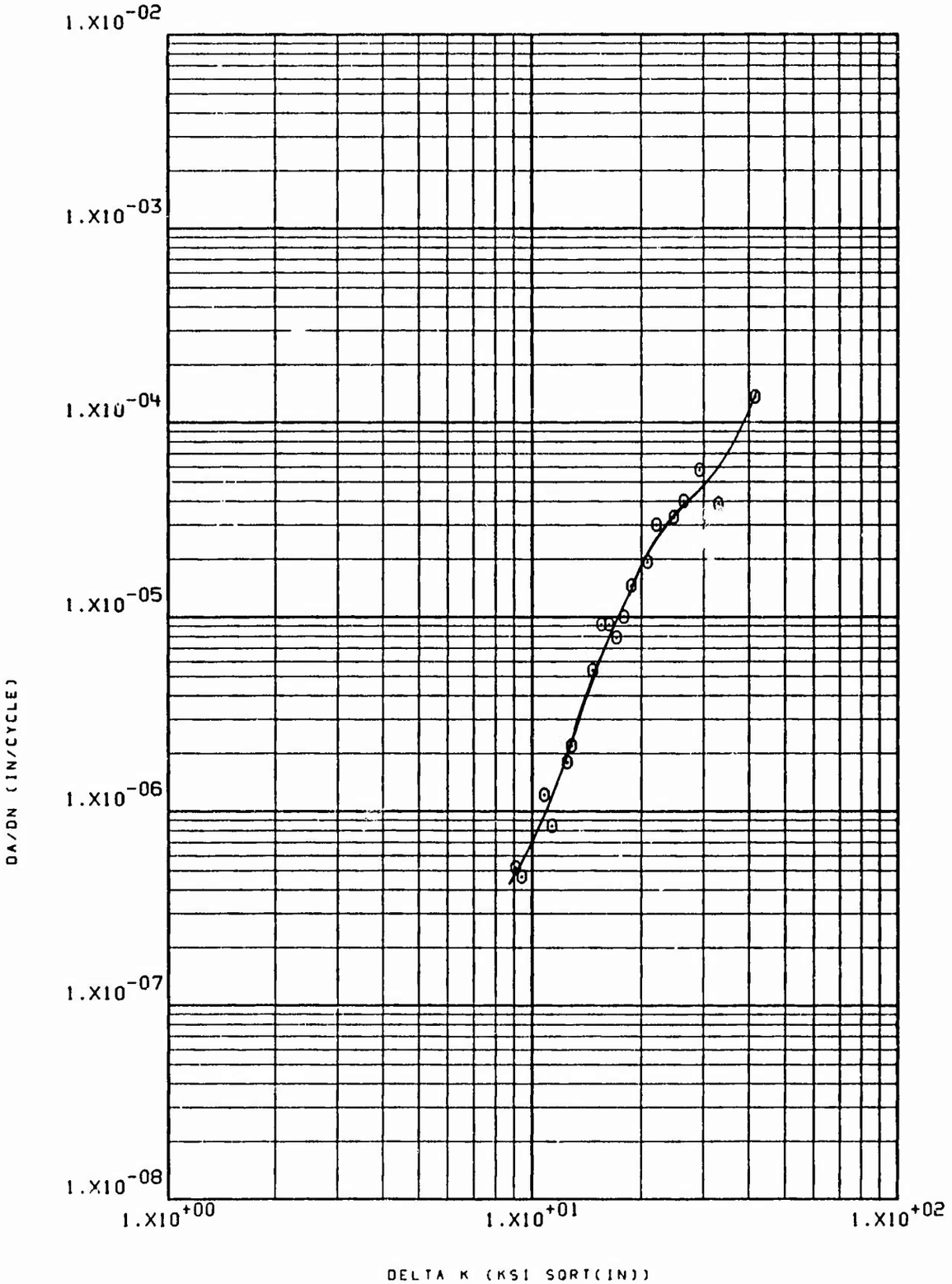
2DC3-1 HPW/TR TI 6AL-4V DB WITH MICROPOROSITY STW RT R=.08 60CPM



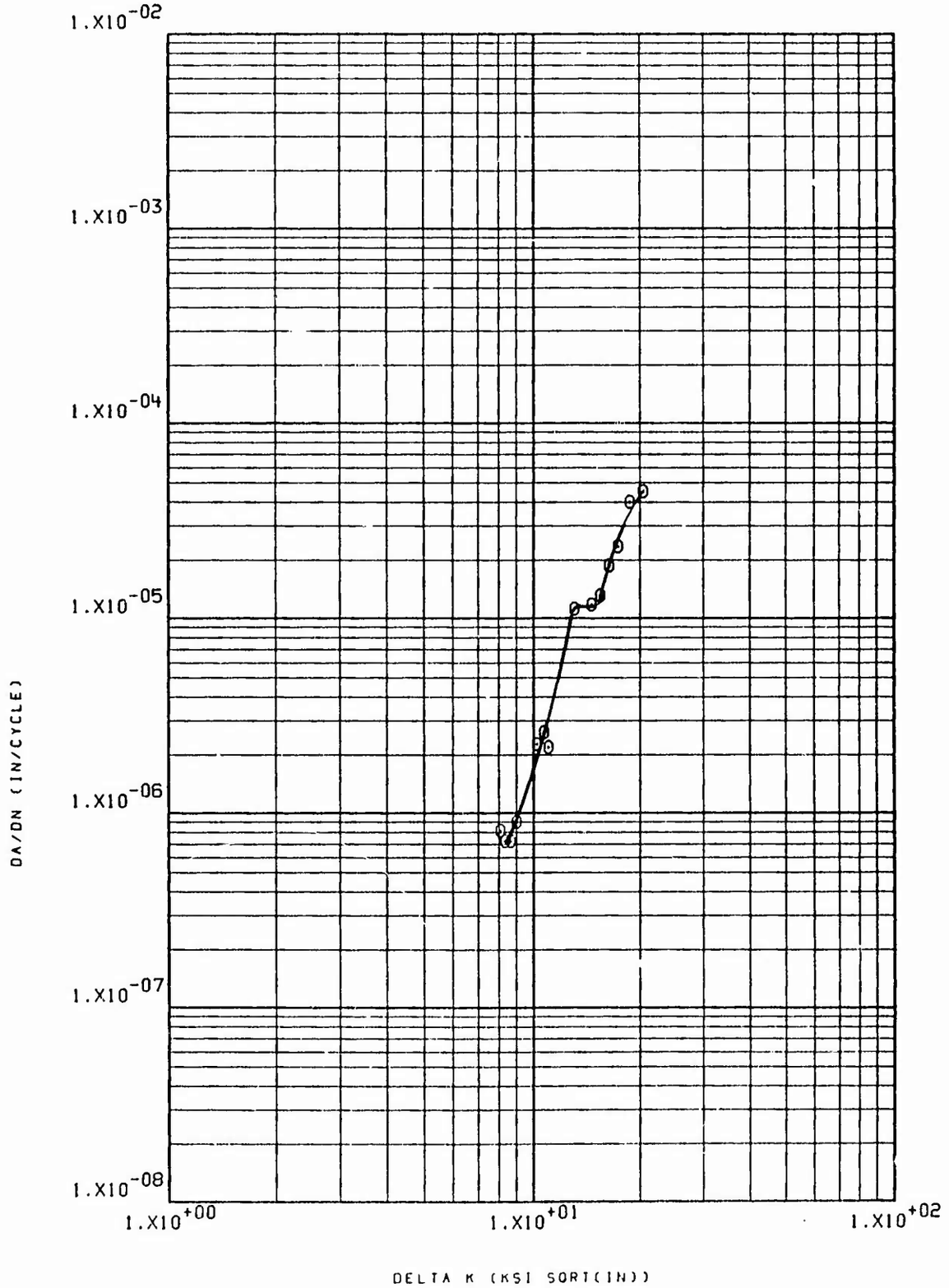
2DC4-1 NRW/TP TI 6AL-4V DB WITH MICROPOROSITY STW RT R=.08 60CPM



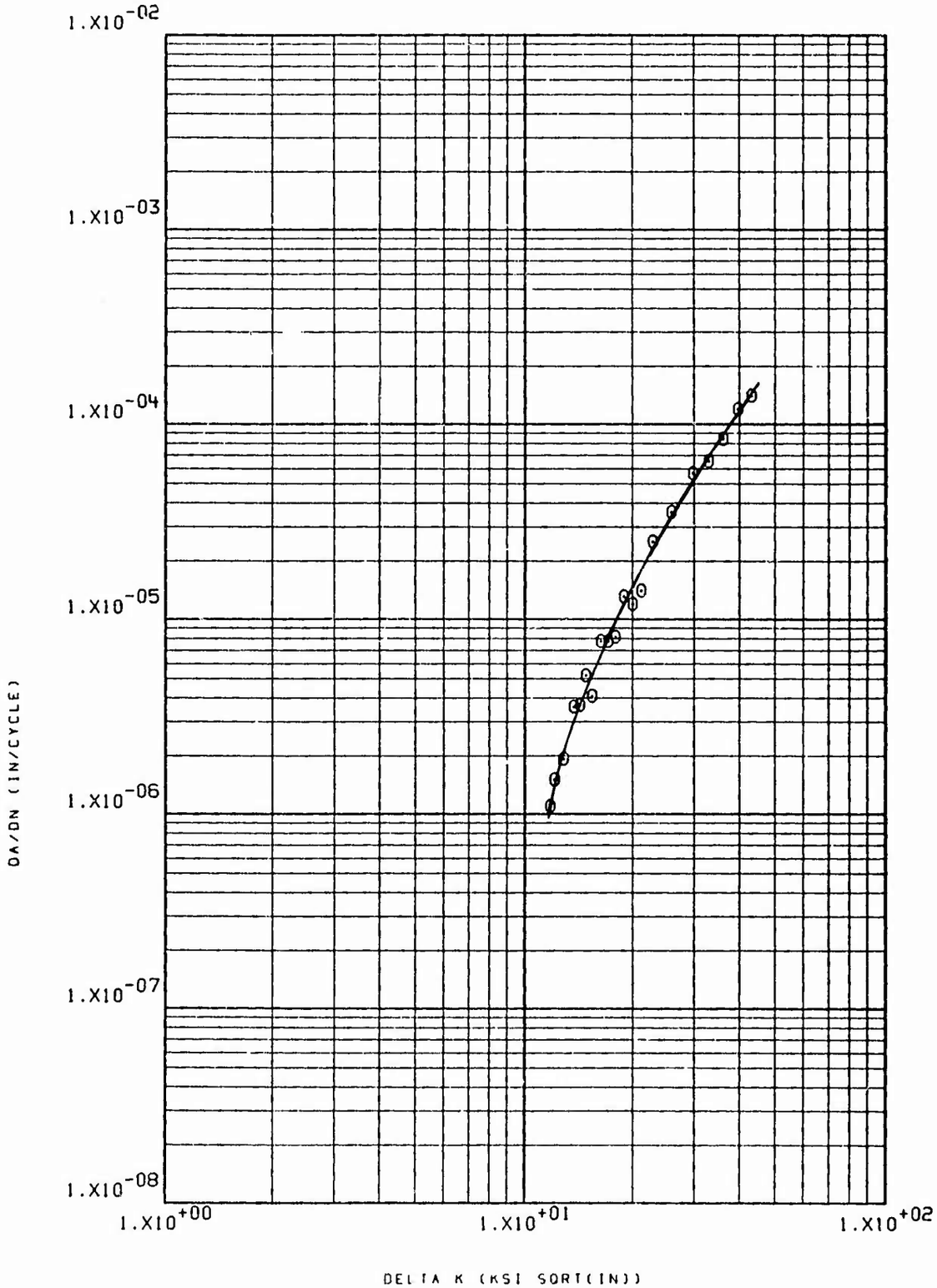
2DC5-1 NRW/TR TI 6AL-4V DB WITH MICROPOROSITY STW RT R=.08 60CPM



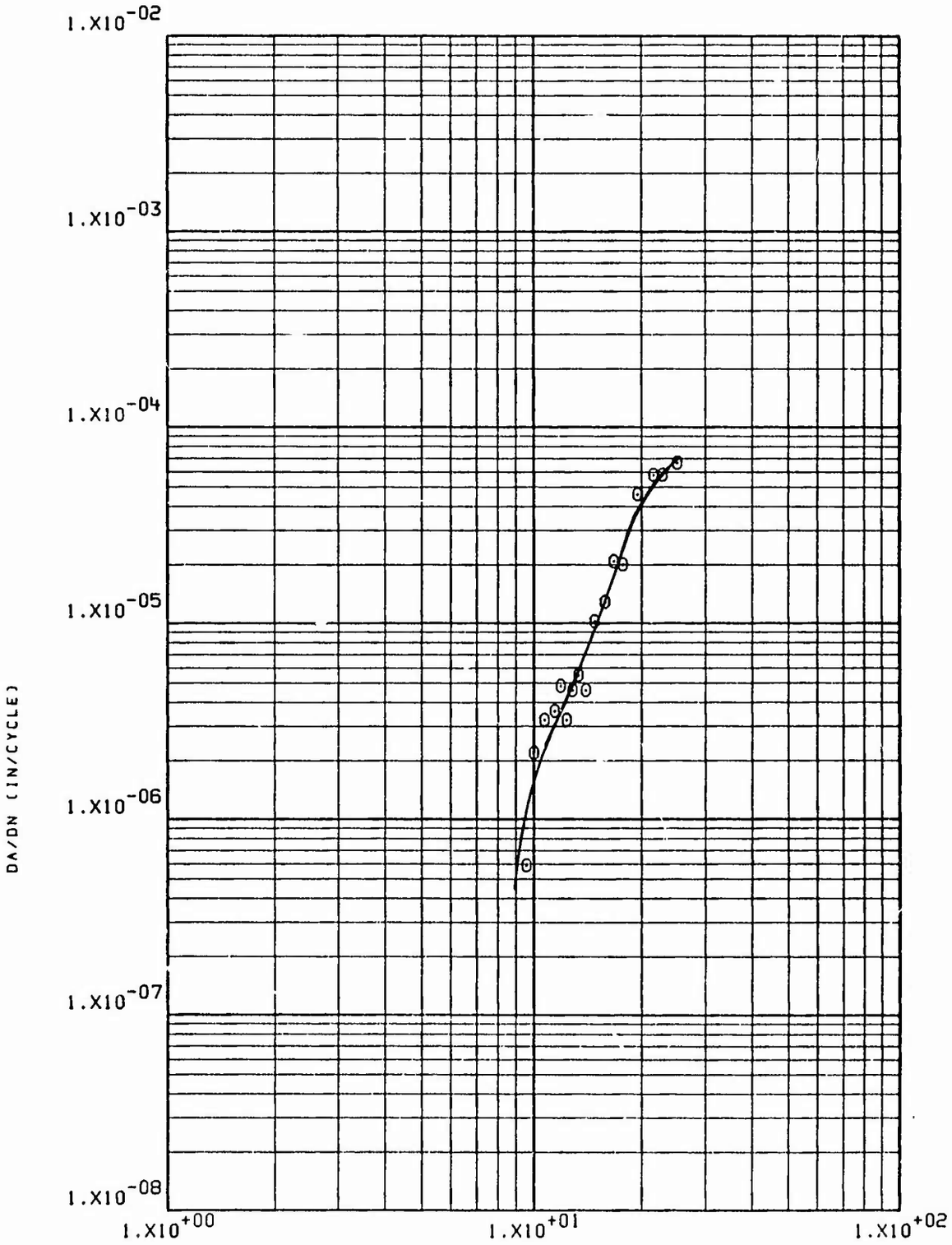
2DC6-1 NPW/TR TI 6AL-4V DB WITH O2 ENRICHMENT STW RT R=.08 60CPM



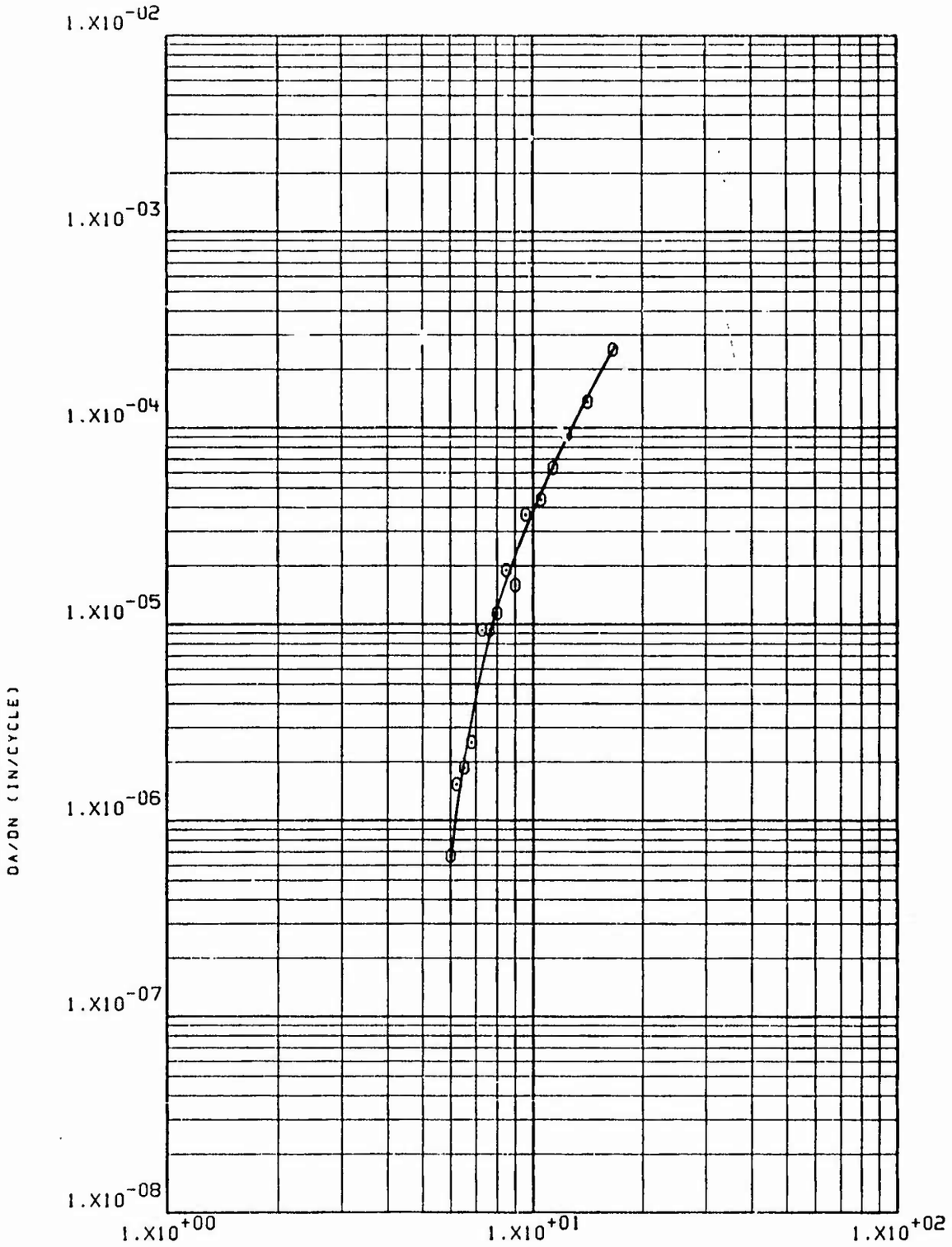
3DA3-1 NWR/TP TI 6AL-4V DB WITH MICROPOROSITY STW RT R=.08 60CPM



3DA4-1 NWR/TP Ti 6AL-4V DB WITH MICROPOROSITY STW RT R=.08 60CPM



3DA5-1 NWR/TR TI 6AL-4V DB WITH MICROPOROSITY STW RT R=.08 60CPM



4DA6-1 NWR/TR TI 6AL-4V DB WITH O2 ENRICHMENT STW RT R=.08 60CPM

APPENDIX B

FATIGUE CRACK GROWTH RATE CURVES

FOR ALL ALUMINUM ALLOY TESTS

APPENDIX : INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No.
2024-T851	1 NRW 3	RW	6.0	0.6	1.0	LHA	R.T.	0.08	60	B-1
" "	1 NRW 4	RW	6.0	0.6	1.0	LHA	R.T.	0.3	60	B-2
" "	1 NWR 7	WR	6.0	0.6	1.0	LHA	R.T.	0.08	60	B-3
" "	1 NWR 8	WR	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-4
" "	1 NRW 11	RW	6.0	0.6	1.0	LA	R.T.	0.05	1800-7800	B-5
" "	1 NRW 16	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-6
2024-T62	1 NRW 18	RW	6.0	0.6	1.0	LHA	R.T.	0.3	360	B-7
2024-T851	1 NRW 19	RW	6.0	0.6	1.0	Dist H_2O	R.T.	0.08	60	B-8
" "	1 NRW 20	RW	6.0	0.6	1.0	STW	R.T.	0.08	60	B-9
" "	1 NRW 6-44	RW	6.0	0.6	0.5	LHA	R.T.	0.08	60	B-10
2024-T851	3 NRW 8-33	RW	6.0	0.6	1.0	LHA	R.T.	0.08	60	B-11
" "	3 NRW 8-34	RW	6.0	0.6	1.0	LHA	R.T.	0.08	60	B-12
" "	3 NWR 8-52	WR	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-13
" "	3 NRW 8-53	RW	6.0	0.6	1.0	JP4	R.T.	0.08	60	B-14
" "	3 NRW 8-107	RW	6.0	0.6	1.0	STW	R.T.	0.08	60	B-15
2219-T851	4 NWR 9-11	WR	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-16
" "	4 NRW 9-12	RW	6.0	0.6	1.0	LHA	R.T.	0.08	60	B-17
" "	4 NRW 9-14	RW	6.0	0.6	1.0	Dist H_2O	R.T.	0.08	60	B-18
" "	4 NRW 9-15	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-19
" "	4 NRW 9-19	RW	6.0	0.6	1.0	STW	R.T.	0.08	360	B-20
" "	4 NRW 9-20	RW	6.0	0.6	1.0	Dist H_2O	R.T.	0.08	60	B-21
" "	4 NRW 9-54	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-22
7075-T7651	5 NRW 17-1	RW	6.0	0.6	0.8	LHA	R.T.	0.08	360	B-23
7075-T7351	5 NRW 17-4	RW	6.0	0.6	0.8	LHA	R.T.	0.08	360	B-24
7075-T7651	5 NRW 17-5	RW	6.0	0.6	0.8	LHA	R.T.	0.3	360	B-25
7075-T7351	5 NRW 17-8	RW	6.0	0.6	0.8	STW	R.T.	0.08	360	B-26
7075-T7651	5 NRW 17-9	RW	6.0	0.6	0.8	LHA	R.T.	0.08	60	B-27
7075-T7351	5 NRW 17-10	RW	6.0	0.6	0.8	LHA	R.T.	0.5	360	B-28
7075-T7651	5 NRW 17-11	RW	6.0	0.6	0.8	STW	R.T.	0.08	60	B-29
7075-T7351	5 NRW 17-14	RW	6.0	0.6	0.8	LHA	R.T.	0.08	360	B-30
" "	5 NWR 17-16	WR	6.0	0.6	0.8	LHA	R.T.	0.08	360	B-31

NOTE: All figures on this page are for CT specimens.

APPENDIX B: INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No.
2219-T851	7 NWR 27-2	WR	6.0	0.6	1.0	STW	R.T.	0.08	60	B-32
" "	7 NRW 27-6A	RW	2.0	0.6	1.0	LA	R.T.	0.08	360	B-33
" "	7 NRW 27-12	RW	6.0	0.6	1.0	LHA	R.T.	0.3	360	B-34
" "	7 NRW 27-13	RW	6.0	0.6	1.0	LHA	R.T.	0.5	360	B-35
" "	7 NRW 27-19	RW	6.0	0.6	1.0	STW	R.T.	0.5	60	B-36
" "	7 NRW 27-20	RW	6.0	0.6	1.0	LHA	R.T.	0.08	6	B-37
" "	7 NRW 27-24	RW	6.0	0.6	1.0	LHA	265	0.08	360	B-38
" "	7 NRW 27-25	RW	6.0	0.6	0.5	LHA	R.T.	0.08	360	B-39
" "	7 NRW 27-26	RW	6.0	0.6	1.0	STW	R.T.	0.08	6	B-40
" "	7 NRW 27-27	RW	6.0	0.6	1.0	SCS	R.T.	0.08	60	B-41
" "	7 NRW 27-30	RW	6.0	0.6	0.25	LHA	R.T.	0.08	360	B-42
" "	7 NRW 27-31	RW	6.0	0.6	1.0	STW	R.T.	0.3	60	B-43
" "	7 NRW 27-35	RW	6.0	0.6	1.0	FCS	R.T.	0.08	60	B-44
" "	7 NRW 27-43	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-45
" "	7 NRW 27-45	RW	7.4	0.486	1.0	STW	150	0.08	60	B-46
" "	7 NRW 27-46	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-47
" "	7 NRW 27-47	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	B-48
" "	7 NRW 27-48	RW	7.4	0.486	1.0	LHA	R.T.	0.08	3800	B-49
" "	7 NRW 27-50	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-50
" "	7 NWR 36-10	WR	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-51
" "	7 NWR 36-11	WR	6.0	0.6	1.0	LHA	265	0.08	360	B-52
2124-T851	12 NRW 35-41	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-53
" "	12 NRW 35-42	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	B-54
" "	12 NRW 35-45	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	B-55
" "	12 NRW 35-46	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	B-56
" "	12 NRW 35-48	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-57
" "	12 NWR 35-73	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-58
" "	12 NWR 35-74	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	B-59
2219-T851	13 NRW 37-12	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-60
" "	13 NRW 37-13	RW	7.4	0.486	1.0	LHA	265	0.08	360	B-61
" "	13 NRW 37-14	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-62
" "	13 NWR 37-15	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	B-63
2124-T851	14 NRW 41-12	RW	4.94	0.486	1.0	LHA	R.T.	0.08	360	B-64
" "	14 NRW 41-13	RW	4.94	0.486	1.0	STW	R.T.	0.08	60	B-65
7075-T7651	15 NRW 42-15	RW	4.94	0.486	0.6	LHA	R.T.	0.08	360	B-66

NOTE: All figures on this page are for CT specimens.

APPENDIX INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No.
2219-T8511	16 NWR 48-1	WR	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-67
" "	16 NWR 48-2	WR	6.0	0.6	1.0	STW	R.T.	0.08	60	B-68
" "	16 NRW 48-3	RW	6.0	0.6	1.0	STW	R.T.	0.08	60	B-69
" "	16 NRW 48-4	RW	6.0	0.6	1.0	LHA	R.T.	0.3	360	B-70
" "	16 NRW 48-5	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-71
7075-T7651	18 NRW 51-1	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	B-72
" "	18 NRW 51-2	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-73
" "	18 NRW 51-3	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-74
" "	18 NRW 51-4	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	B-75
" "	18 NRW 51-5	RW	7.4	0.486	1.0	STW	R.T.	0.08	6	B-76
" "	18 NRW 51-6	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	B-77
" "	18 NRW 51-7	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	B-78
" "	18 NRW 51-8	RW	7.4	0.486	1.0	SCS	R.T.	0.08	60	B-79
" "	18 NRW 51-9	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	B-80
" "	18 NRW 51-10	RW	7.4	0.486	1.0	LHA	265	0.08	360	B-81
" "	18 NRW 51-12	RW	7.4	0.486	1.0	LHA	265	0.08	60	B-82
" "	18 NRW 51-13	RW	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-83
" "	18 NRW 51-14	RW	7.4	0.486	0.25	LHA	R.T.	0.08	360	B-84
" "	18 NWR 51-15	WR	7.4	0.486	1.0	SCS	R.T.	0.08	60	B-85
" "	18 NWR 51-16	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-86
" "	18 NWR 51-17	WR	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-87
7075-T7351	18 NRW 51-60	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	B-88
" "	18 NRW 51-61	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	B-89
" "	18 NRW 51-62	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-90
" "	18 NWR 51-63	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-91
" "	18 NWR 51-64	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	B-92
2024-T852	19 NRW 64-13	RW	6.18	0.486	1.0	LHA	R.T.	0.08	360	B-93
" "	19 NRW 64-14	RW	6.18	0.486	1.0	LHA	R.T.	0.08	60	B-94
" "	19 NRW 64-15	RW	6.18	0.486	1.0	STW	R.T.	0.08	60	B-95
" "	19 NRW 64-16	RW	6.18	0.486	1.0	LHA	R.T.	0.08	360	B-96
" "	19 NWR 64-17	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-97
2219-T852	20 NRW 65-1	RW	6.18	0.486	1.0	LHA	R.T.	0.08	360	B-98
7175-T736	21 NRW 67-1	RW	2.81	0.6	0.5	LHA	R.T.	0.08	360	B-99

NOTE: All figures on this page are for CT specimens.

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Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No.
7075-T7352	22 NRW 68-1	RW	2.81	0.6	0.5	LHA	R.T.	0.08	360	B-100
" "	22 NRW 68-12	RW	3.0	0.6	0.5	LHA	R.T.	0.08	360	B-101
7050-T73	23 NRW 69-1	RW	2.81	0.6	0.5	LHA	R.T.	0.08	360	B-102
7049-T73 (Zr modified)	24 NRW 70-1	RW	2.81	0.6	0.5	LHA	R.T.	0.08	360	B-103
7049-T7352	25 NRW 71-1	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	B-104
" "	25 NRW 71-2	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	B-105
" "	25 NRW 71-3	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-106
" "	25 NRW 71-4	RW	7.4	0.486	1.0	STW	R.T.	0.08	6	B-107
" "	25 NRW 71-5	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	B-108
" "	25 NRW 71-6	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	B-109
" "	25 NRW 71-7	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-110
" "	25 NRW 71-9	RW	7.4	0.486	0.25	LHA	R.T.	0.08	360	B-111
" "	25 NRW 71-10	RW	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-112
" "	25 NWR 71-11	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	B-113
" "	25 NWR 71-12	WR	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-114
" "	25 NRW 71-43	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	B-115
" "	25 NWR 71-44	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	B-116
7175-T73652	26 NRW 72-27	RW	7.4	0.486	1.0	LHA	R.T.	0.08	6	B-117
" "	26 NRW 72-28	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	B-118
" "	26 NRW 72-29	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-119
" "	26 NRW 72-30	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	B-120
" "	26 NRW 72-31	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	B-121
" "	26 NRW 72-32	RW	7.4	0.486	1.0	LHA	265	0.08	360	B-122
" "	26 NRW 72-33	RW	7.4	0.486	1.0	STW	R.T.	0.08	6	B-123
" "	26 NRW 72-34	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-124
" "	26 NRW 72-35	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	B-125
" "	26 NRW 72-36	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	B-126
" "	26 NRW 72-37	RW	7.4	0.486	1.0	SCS	R.T.	0.08	60	B-127
" "	26 NRW 72-38	RW	7.4	0.486	1.0	FCS	R.T.	0.08	60	B-128
" "	26 NRW 72-40	RW	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-129
" "	26 NRW 72-41	RW	7.4	0.486	0.25	LHA	R.T.	0.08	360	B-130
" "	26 NWR 72-44	WR	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-131
" "	26 NWR 72-45	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	B-132
" "	26 NWR 72-46	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-133

NOTE: All figures on this page are for CT specimens.

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Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No.
2024-T852	27 NRW 75-1	RW	7.4	0.486	1.0	LHA	R.T.	0.08	6	B-134
" "	27 NRW 75-2	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	B-135
" "	27 NRW 75-3	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-136
" "	27 NRW 75-4	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	B-137
" "	27 NRW 75-5	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	B-138
" "	27 NRW 75-6	RW	7.4	0.486	1.0	JP4	R.T.	0.08	60	B-139
" "	27 NRW 75-7	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-140
" "	27 NRW 75-8	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-141
" "	27 NRW 75-9	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	B-142
" "	27 NRW 75-10	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	B-143
" "	27 NRW 75-11	RW	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-144
" "	27 NRW 75-12	RW	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-145
" "	27 NRW 75-13	RW	7.4	0.486	0.25	LHA	R.T.	0.08	360	B-146
" "	27 NRW 75-14	RW	7.4	0.486	1.0	STW	150	0.08	60	B-147
" "	27 NRW 75-15	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	B-148
2024-T852	27 NRW 75-16	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	B-149
" "	27 NRW 75-17	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	B-150
" "	27 NRW 75-51	RW	7.4	0.486	1.0	STW	150	0.08	60	B-151
" "	27 NRW 75-52	RW	7.4	0.486	1.0	SCS	R.T.	0.08	60	B-152
" "	27 NRW 75-53	RW	7.4	0.486	1.0	LHA	R.T.	0.7	360	B-153
" "	27 NRW 75-54	RW	7.4	0.486	1.0	LHA	265	0.08	360	B-154
" "	27 NWR 75-55	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	B-155
" "	27 NWR 75-56	WR	7.4	0.486	1.0	STW	R.T.	0.08	6	B-156
" "	27 NWR 75-57	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	B-157
" "	27 NWR 75-58	WR	7.4	0.486	1.0	LHA	265	0.08	360	B-158
" "	27 NWR 75-59	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-159
7050-T73651	28 NRW 80-22	RW	6.0	0.6	1.0	LHA	R.T.	0.5	360	B-160
" "	28 NRW 80-23	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-161
" "	28 NRW 80-24	RW	6.0	0.6	1.0	LHA	R.T.	0.3	360	B-162
" "	28 NWR 80-25	WR	6.0	0.6	1.0	STW	R.T.	0.08	60	B-163
" "	28 NWR 80-26	WR	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-164

NOTE: All figures on this page are for CT specimens.

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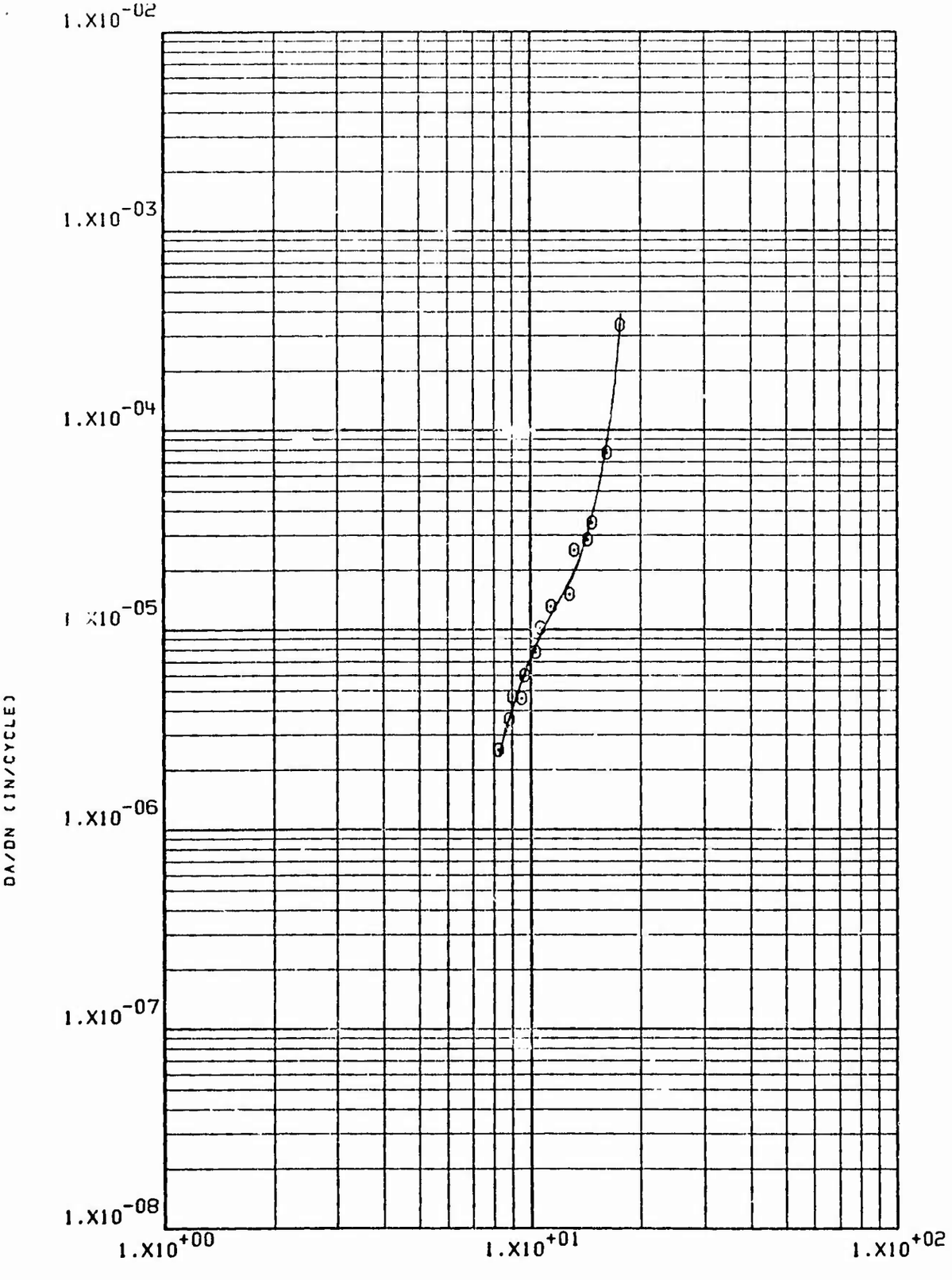
Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No.
7075-T73511	29 NRW 83-1	RW	7.4	0.486	1.0	LHA	R.T.	0.08	6	B-165
" "	29 NRW 83-2	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	B-166
" "	29 NRW 83-3	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-167
" "	29 NRW 83-4	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	B-168
" "	29 NRW 83-5	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	B-169
" "	29 NRW 83-6	RW	7.4	0.486	1.0	LHA	265	0.08	360	B-170
" "	29 NRW 83-7	RW	7.4	0.486	1.0	STW	R.T.	0.08	6	B-171
" "	29 NRW 83-8	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	B-172
" "	29 NRW 83-9	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	B-173
" "	29 NRW 83-10	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	B-174
" "	29 NRW 83-11	RW	7.4	0.486	1.0	SCS	R.T.	0.08	60	B-175
" "	29 NRW 83-12	RW	7.4	0.486	1.0	LHA	R.T.	0.7	360	B-176
" "	29 NRW 83-13	RW	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-177
" "	29 NRW 83-14	RW	7.4	0.486	0.25	LHA	R.T.	0.08	360	B-178
" "	29 NWR 83-15	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-179
7075-T73511	29 NWR 83-16	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	B-180
" "	29 NWR 83-17	WR	7.4	0.486	1.0	SCS	R.T.	0.08	360	B-181
" "	29 NWR 83-18	WR	7.4	0.486	0.5	LHA	R.T.	0.08	360	B-182
7075-T76	30 NRW 85-1	RW			0.1	LHA	R.T.	0.08	60	B-183
" "	30 NRW 85-2	RW			0.1	LHA	R.T.	0.08	360	B-184
" "	30 NRW 85-3	RW			0.1	LHA	R.T.	0.3	360	B-185
" "	30 NRW 85-4	RW			0.1	STW	R.T.	0.08	60	B-186
" "	30 NRW 85-5	RW			0.1	SCS	R.T.	0.08	60	B-187
" "	30 NRW 85-7	RW			0.1	Freon TF	R.T.	0.08	60	B-188
" "	30 NWR 85-12	WR			0.1	LHA	R.T.	0.08	360	B-189
7075-T76	301 NRW 86-4	RW			0.1	LHA	R.T.	0.08	360	B-190

NOTE: Figures 30 NRW 85-1 through 301 NRW 86-4 are for CCT specimens. All others are for CT specimens.

APPENDIX B: INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No.
2024-T81	302 NRW 87-1	RW			0.1	LHA	R.T.	0.08	60	B-191
" "	302 NRW 87-2	RW			0.1	LHA	R.T.	0.08	360	B-192
" "	302 NRW 87-3	RW			0.1	LHA	R.T.	0.3	360	B-193
" "	302 NRW 87-4	RW			0.1	LHA	R.T.	0.5	360	B-194
" "	302 NRW 87-5	RW			0.1	JP4	R.T.	0.08	60	B-195
" "	302 NRW 87-6	RW			0.1	STW	R.T.	0.08	60	B-196
" "	302 NWR 87-13	WR			0.1	LHA	R.T.	0.08	360	B-197
" "	302 NWR 87-14	WR			0.1	STW	R.T.	0.08	60	B-198
2024-T81	303 NRW 88-1	RW			0.1	LHA	R.T.	0.08	60	B-199
" "	303 NRW 88-3	RW			0.1	LHA	R.T.	0.3	360	B-200
" "	303 NRW 88-4	RW			0.1	LHA	R.T.	0.5	360	B-201
" "	303 NRW 88-5	RW			0.1	JP4	R.T.	0.08	60	B-202
" "	303 NRW 88-6	RW			0.1	STW	R.T.	0.08	60	B-203
" "	303 NRW 88-9	RW			0.1	LHA	R.T.	0.08	360	B-204
" "	303 NWR 88-11	WR			0.1	LHA	R.T.	0.08	360	B-205
" "	303 NWR 88-14	WR			0.1	STW	R.T.	0.08	60	B-206
2219-T851	304 NRW 89-6	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	B-207
7075-T76511	309 NRW 96-6	RW	6.0	0.6	1.0	STW	R.T.	0.08	60	B-208
" "	309 NRW 96-7	RW	6.0	0.6	1.0	LHA	R.T.	0.3	360	B-209
" "	309 NRW 96-8	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-210
" "	309 NWR 96-9	WR	6.0	0.6	1.0	LHA	R.T.	0.08	360	B-211
7075-T73511	311 NWR 100-1	WR	6.0	0.6	1.0	STW	R.T.	0.08	60	B-212
2219-T851	314 NRW 110-1	RW	7.4	0.486	1.0	LHA	R.T.	.08	360	B-213

NOTE: Figures 302 NRW 87-1 through 303 NWR 88-14 are for CCT specimens. All others are for CT specimens.



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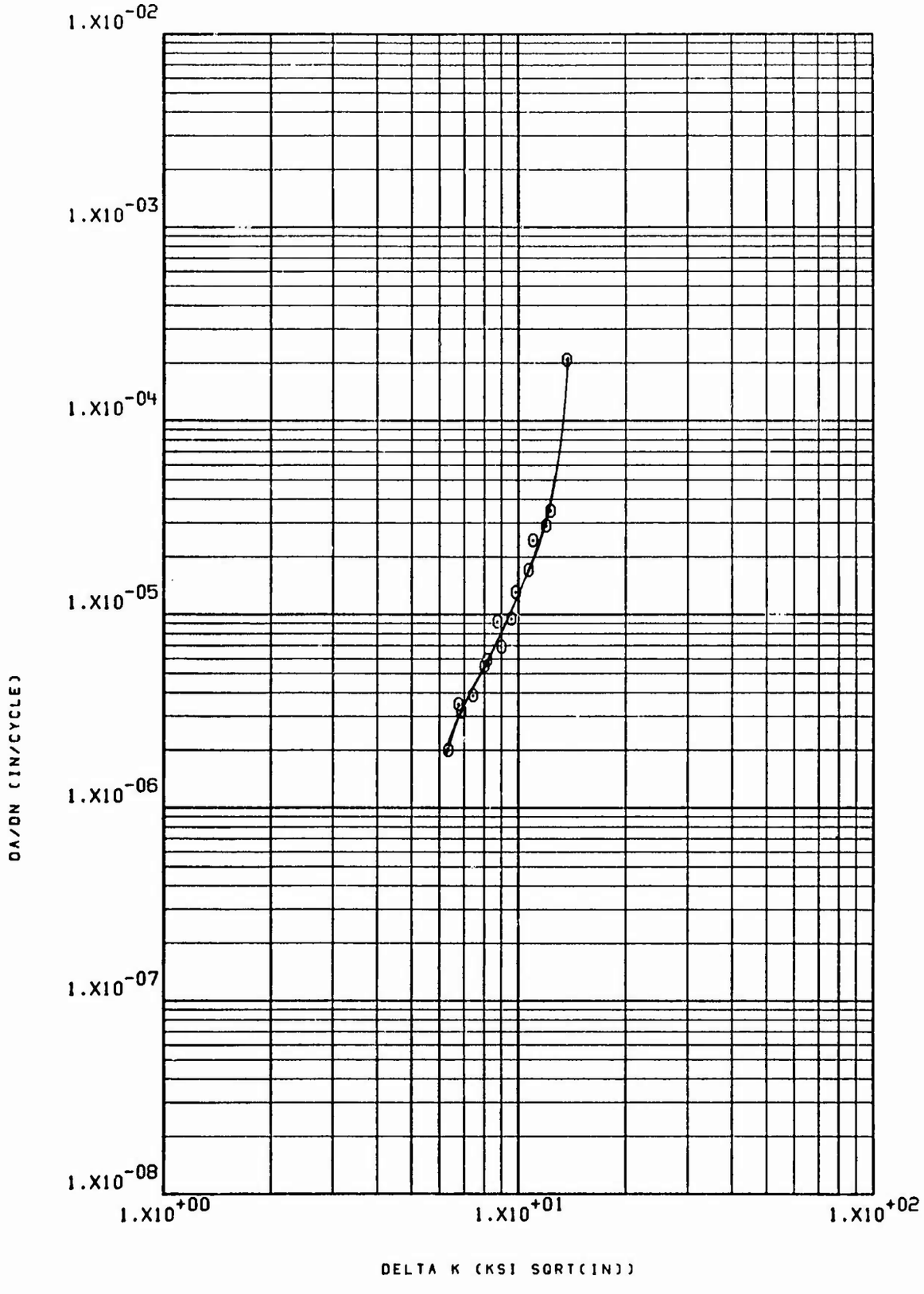

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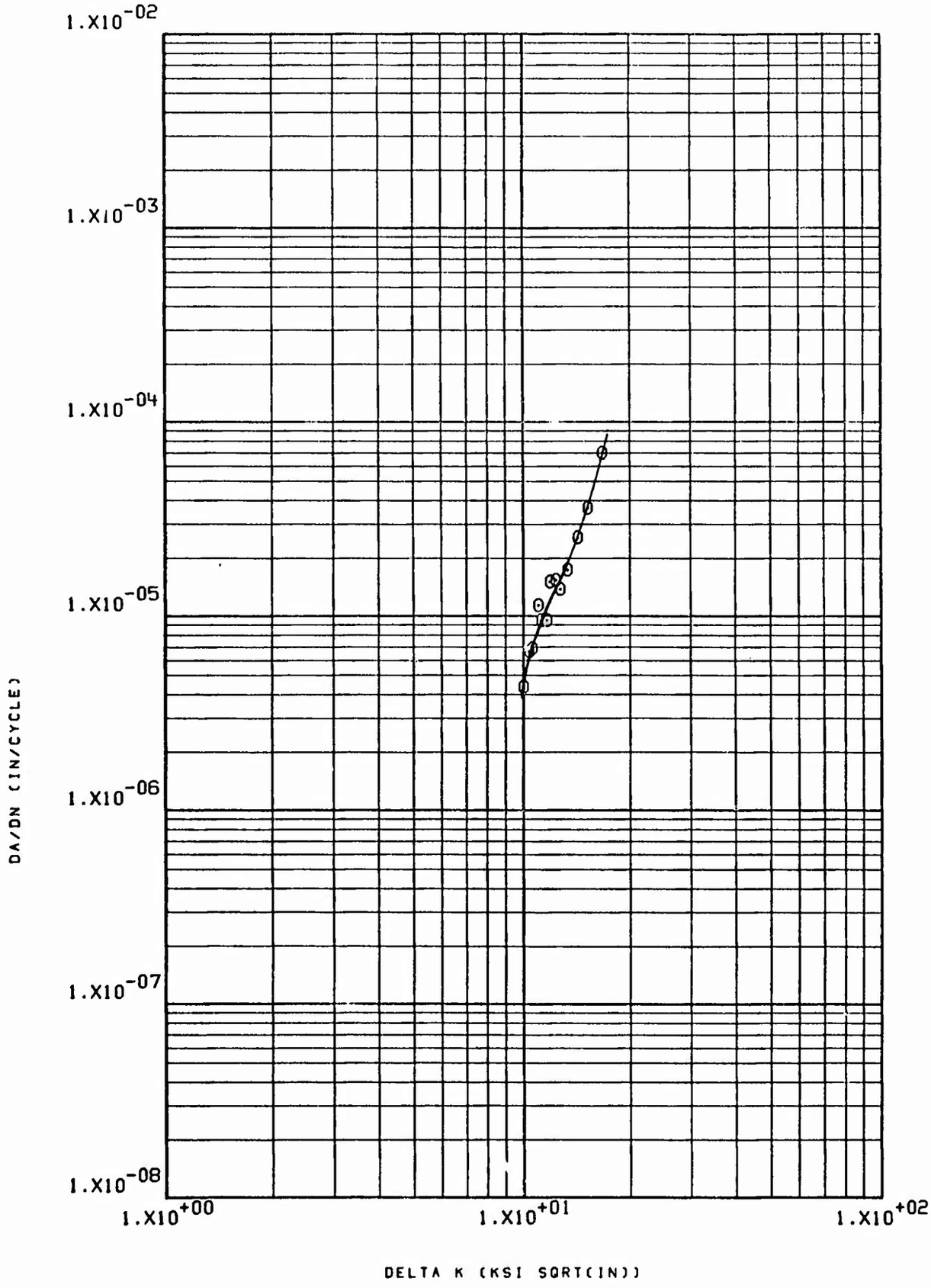

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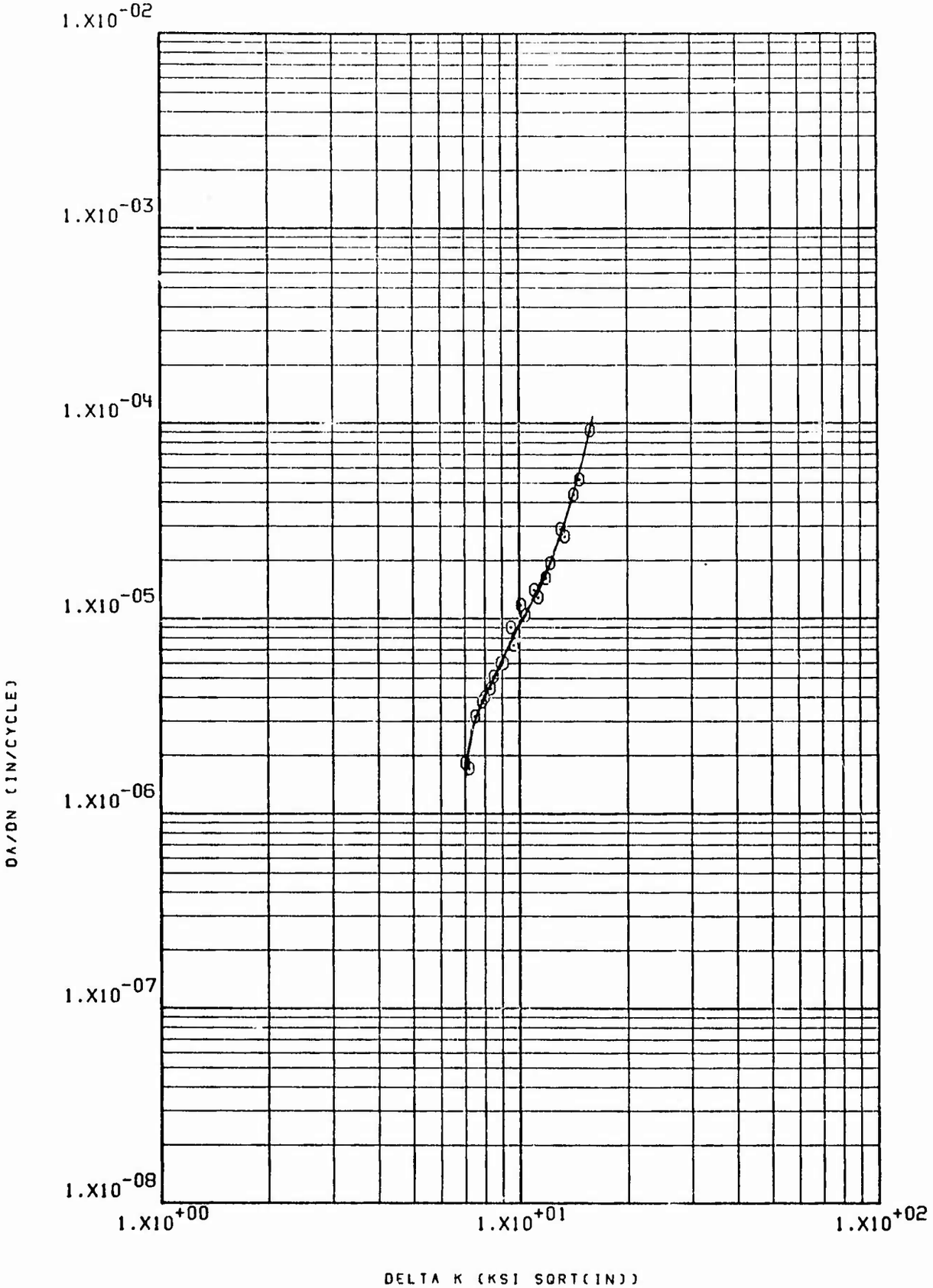

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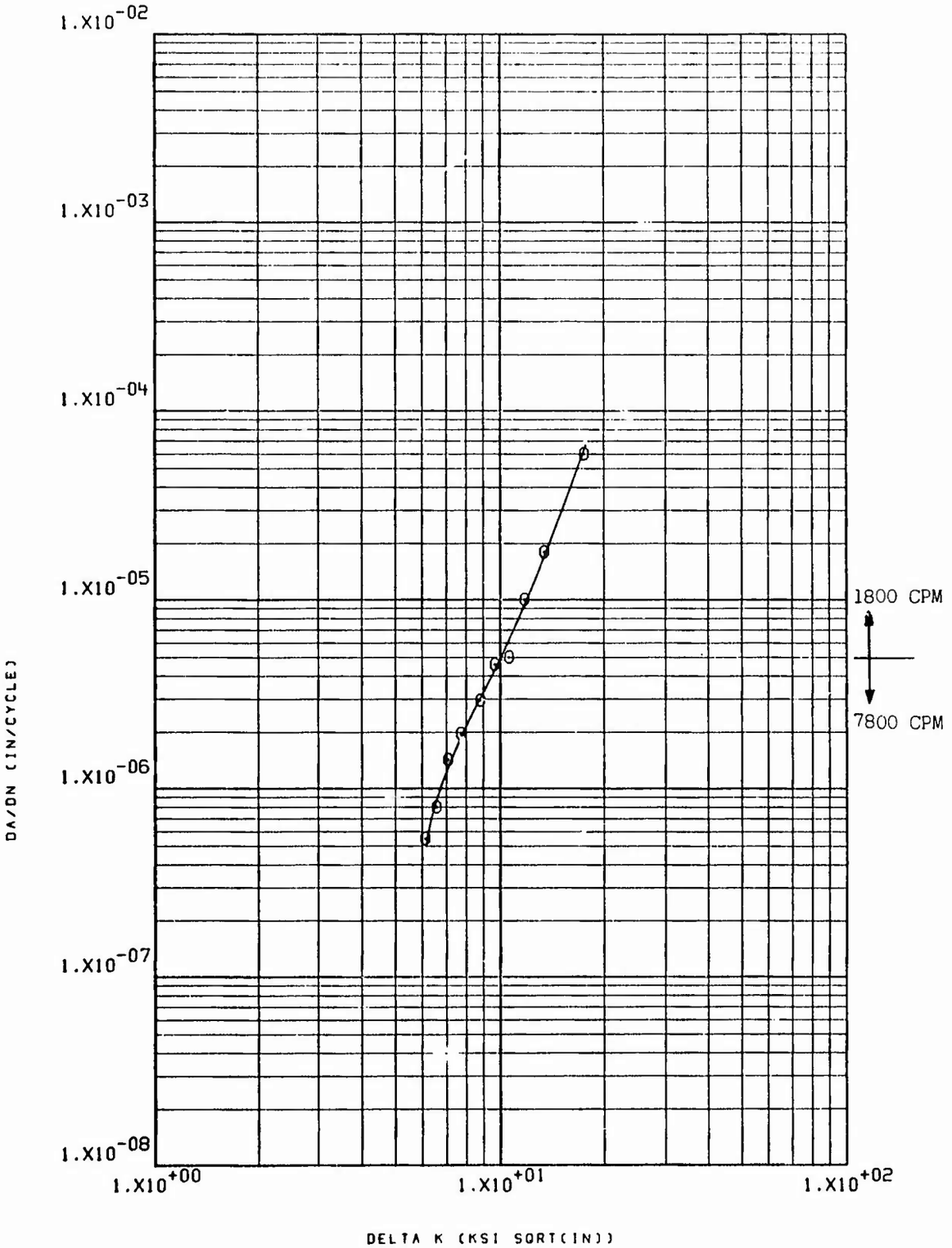
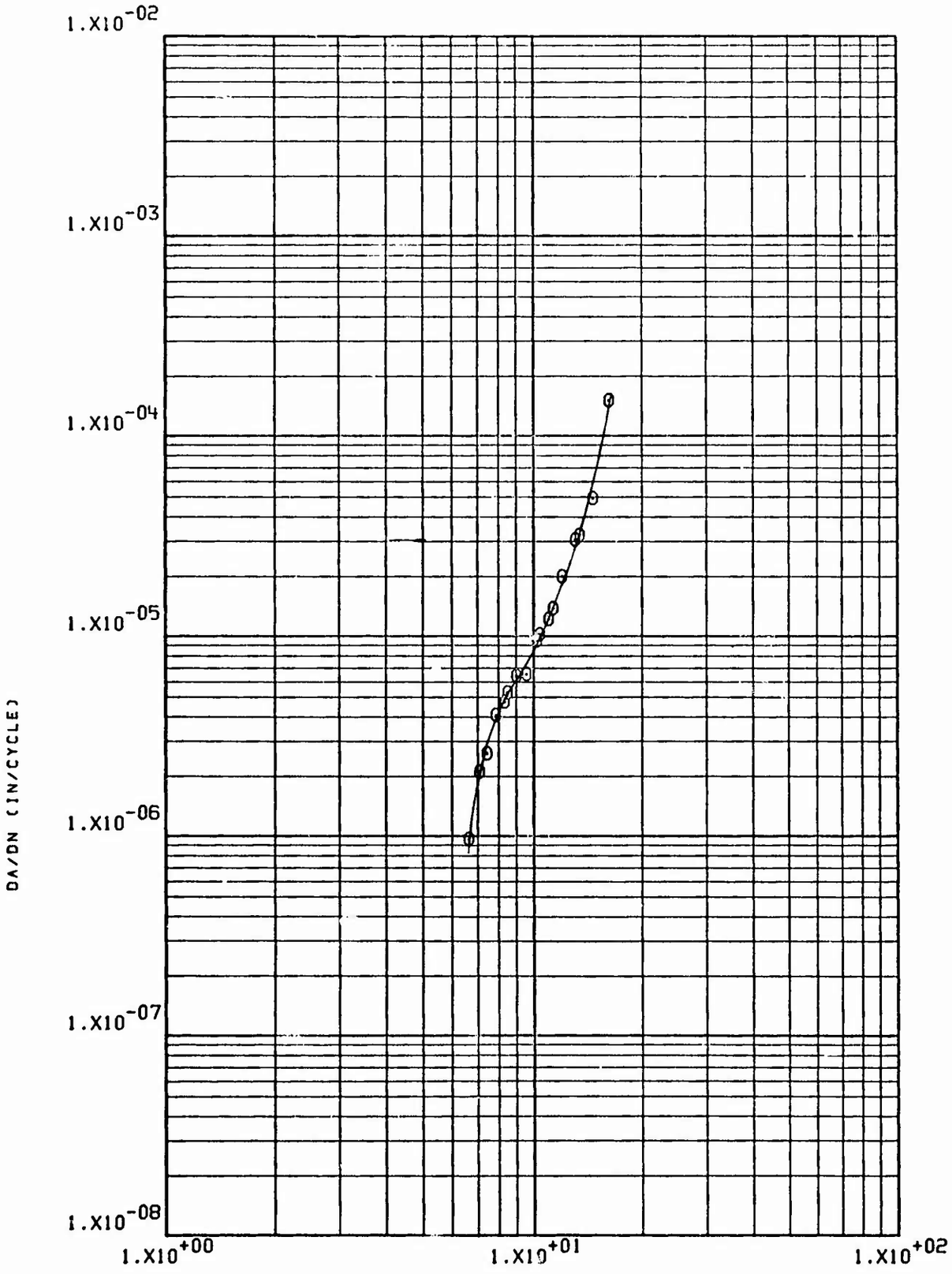
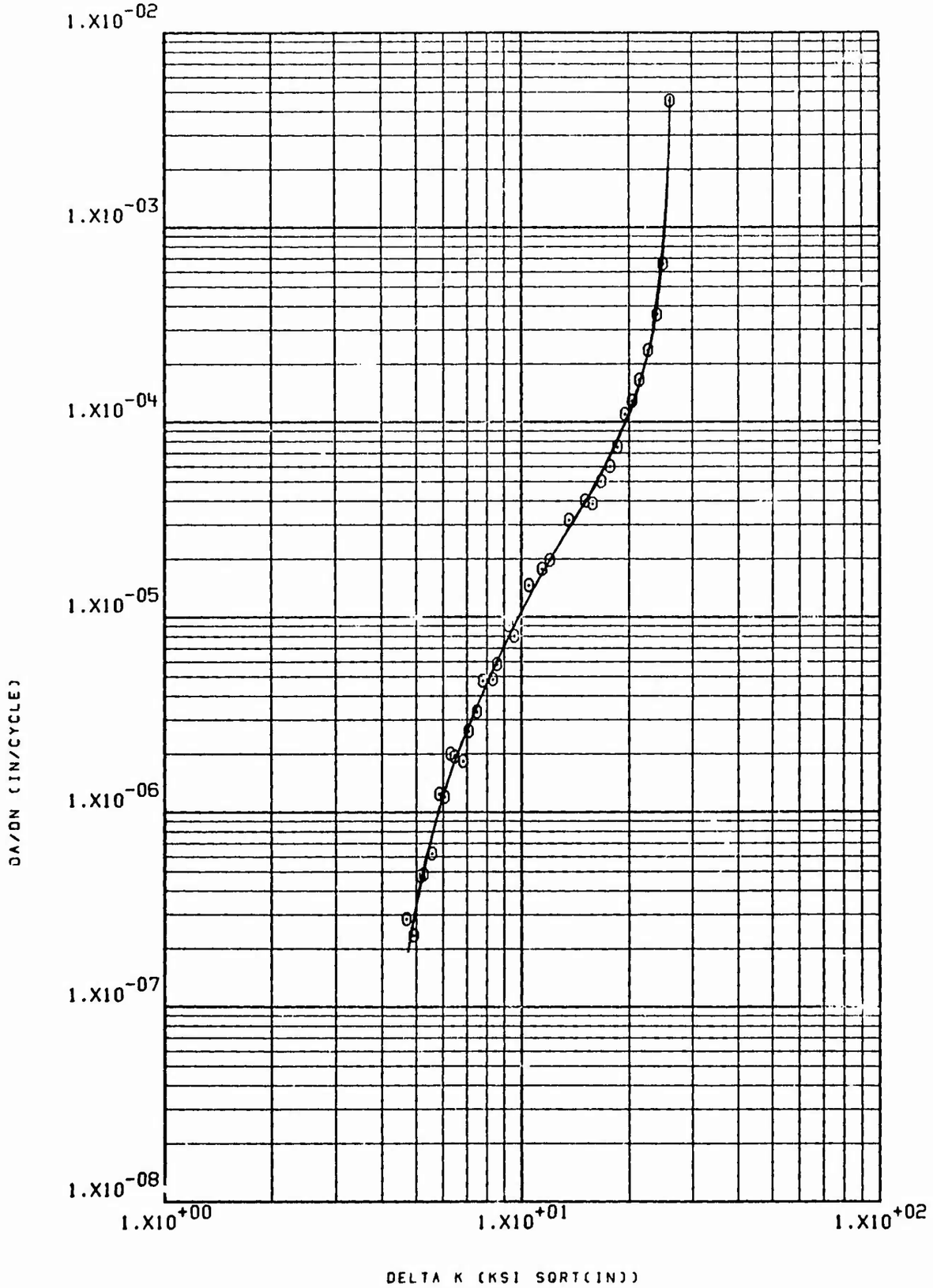


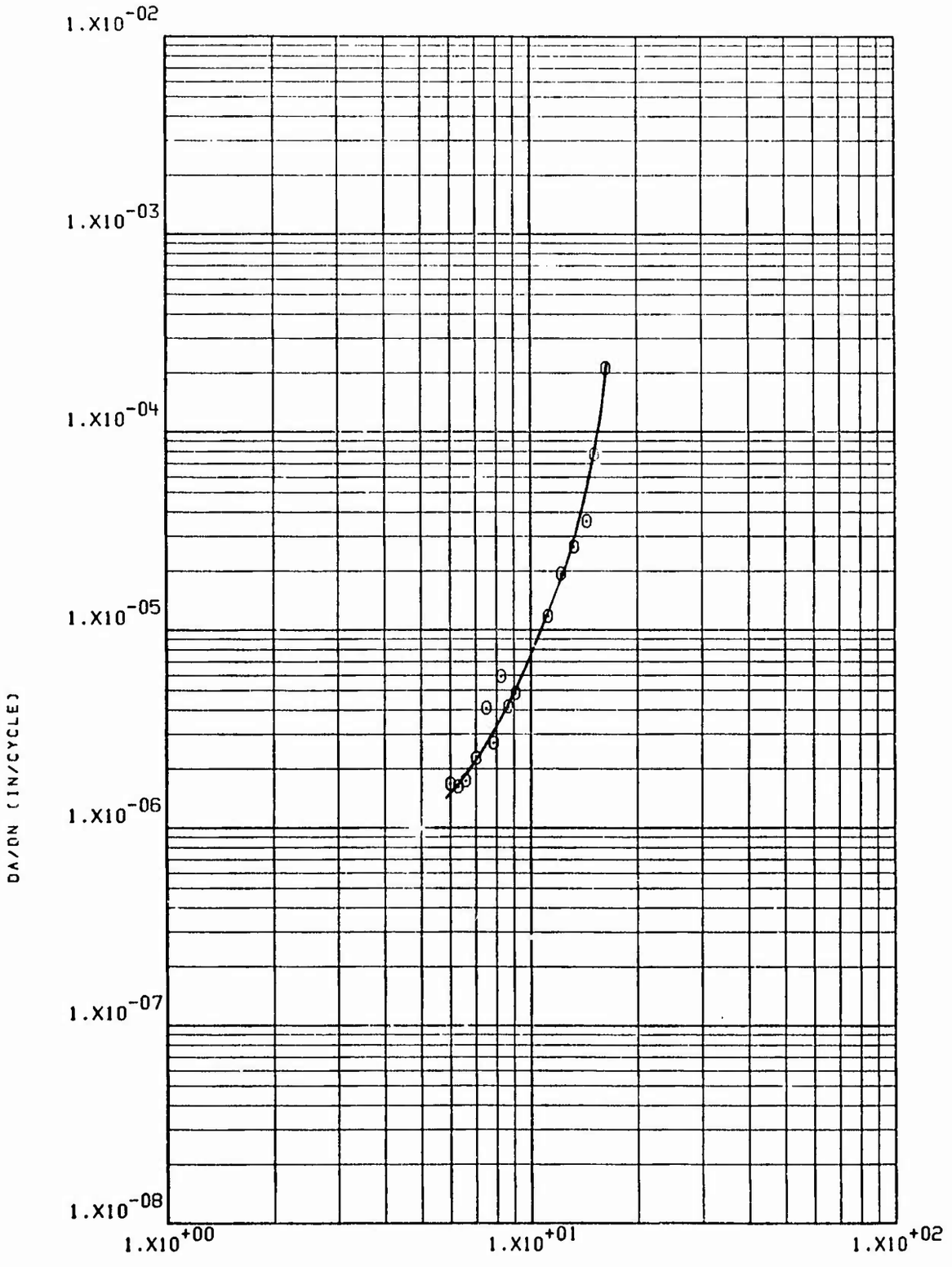
1 NRW 11 2024-T851 LA R.T. R=.05 7800 & 1800 cpm



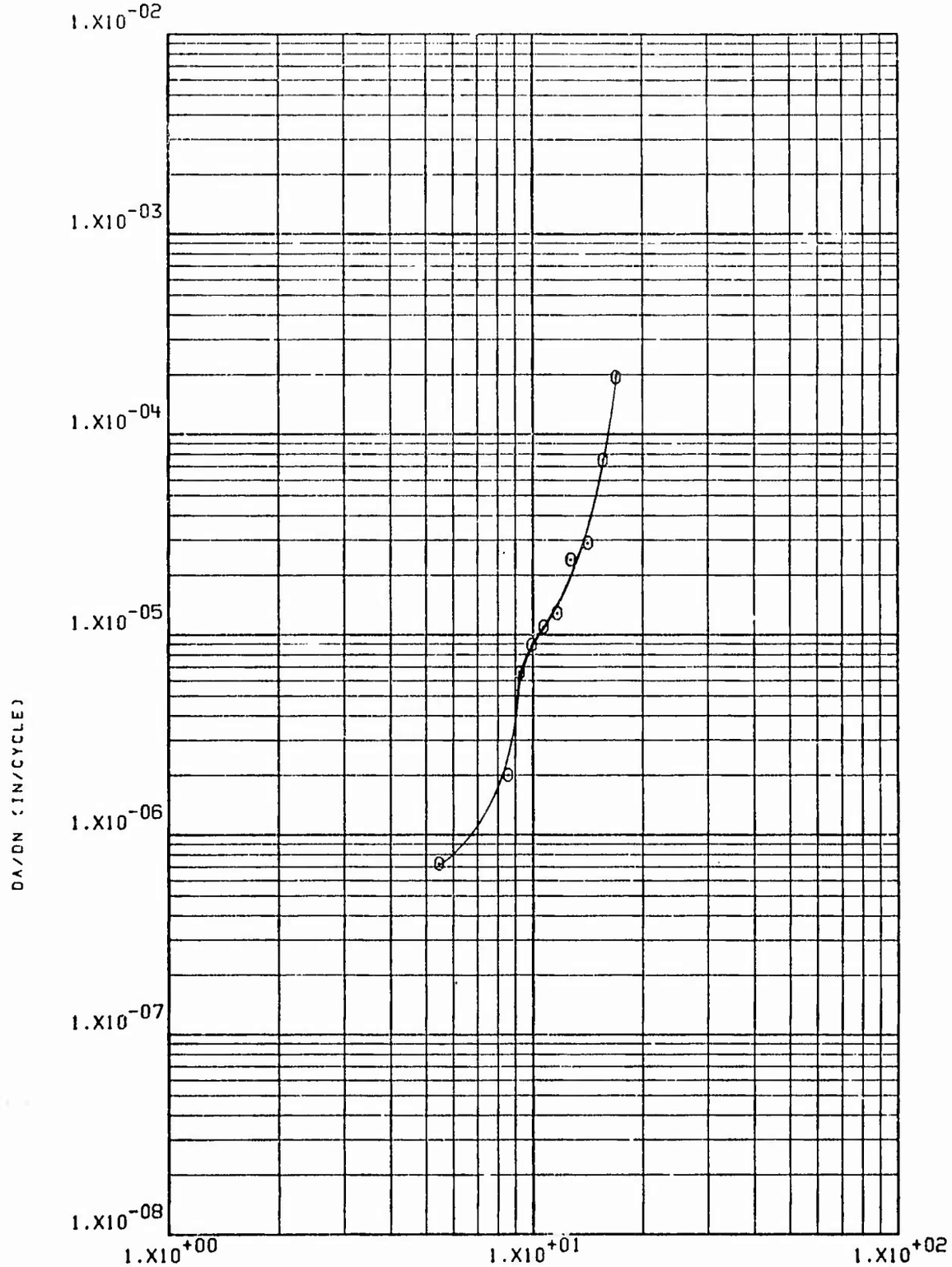
1 NRW 16 2024-T-851 LHA R.T. 360CPM R=.08



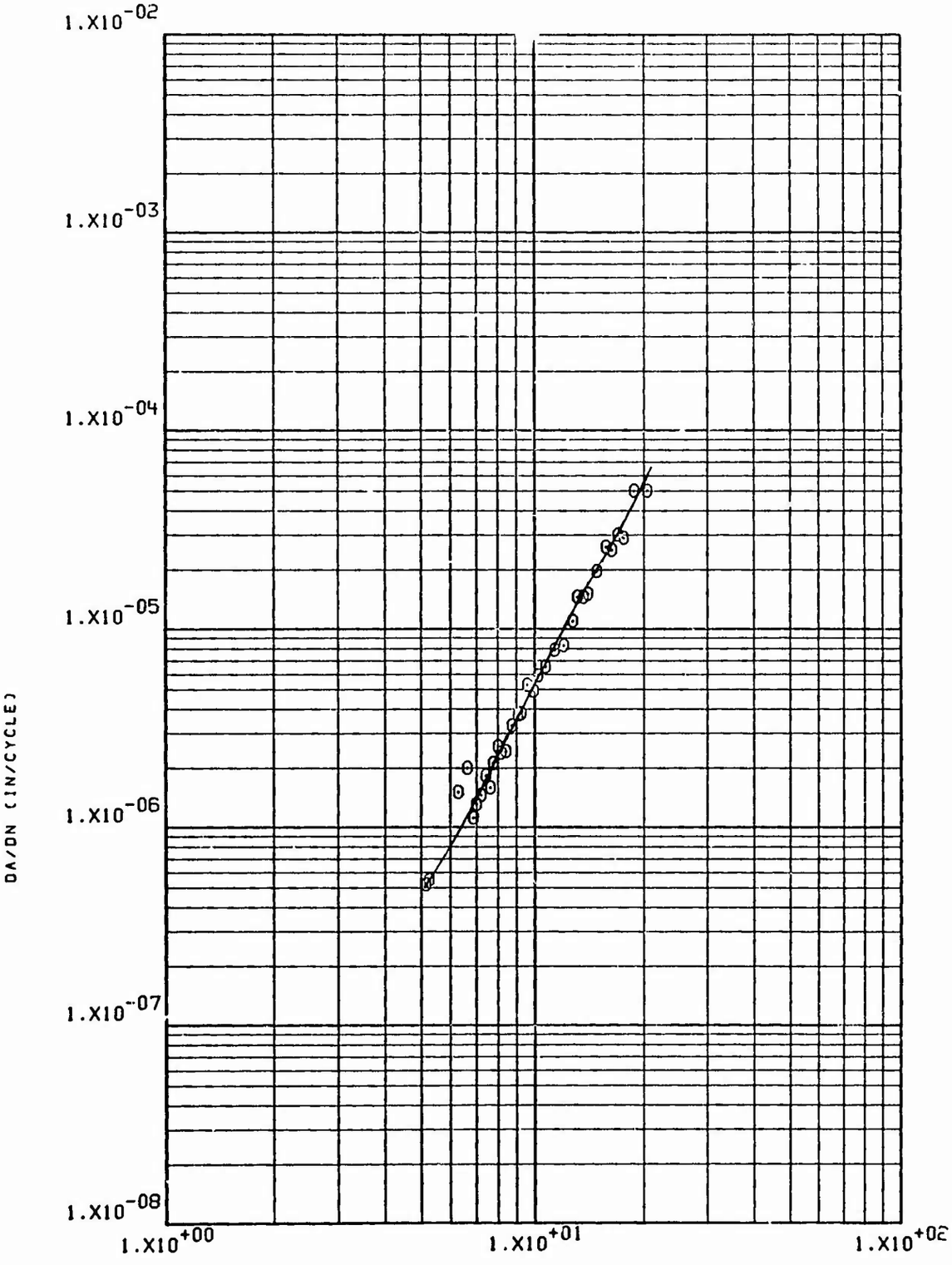
1 NRW 18 2024-T-62 LHA R.T. 360CPM R=.3



1 NRW 19 2024-T-851 R.T. DISTILLED WATER 60CPM R=.08



1 NRW 20 2024-T851 SUMP R.T. 60CPM R=.08



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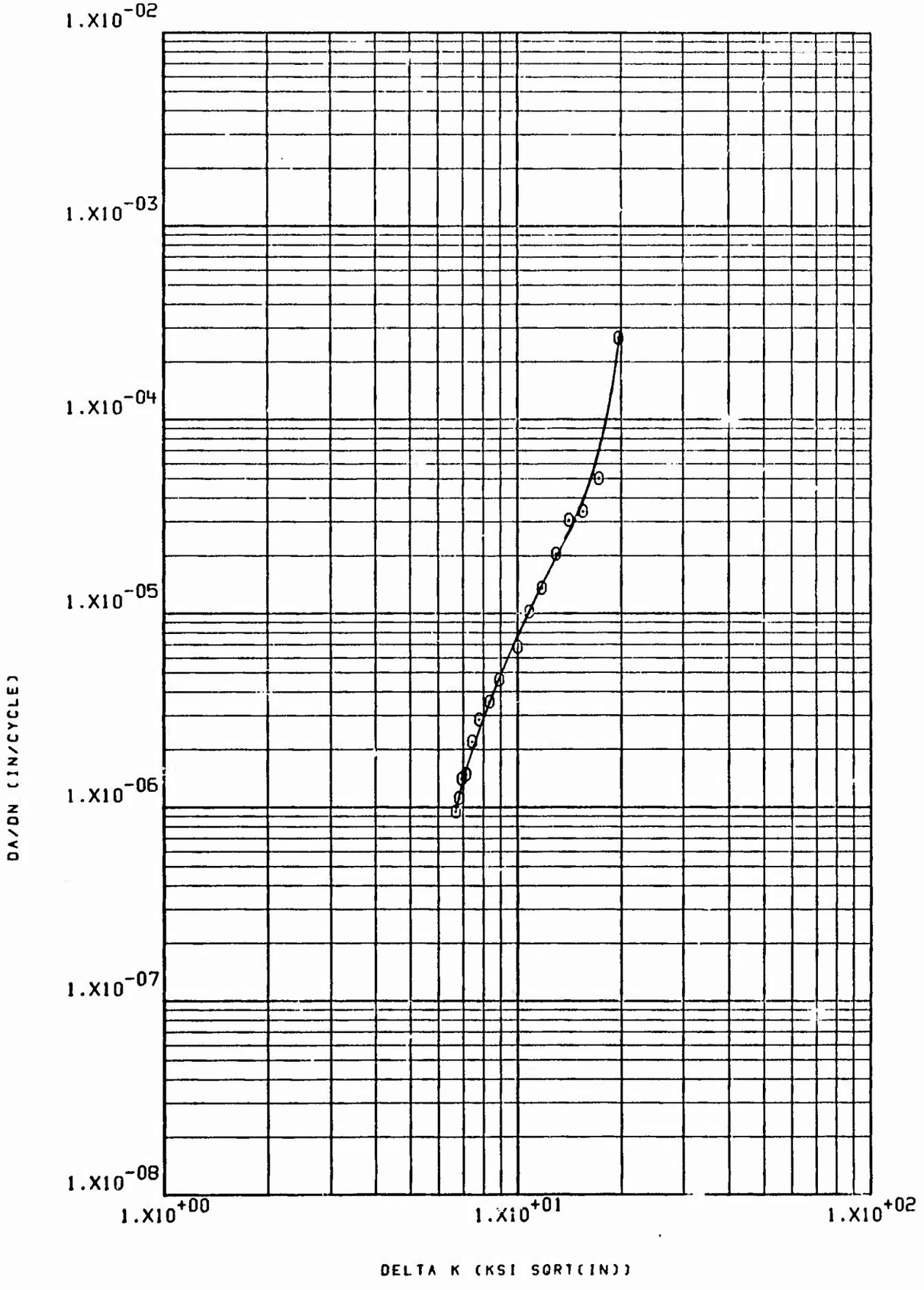

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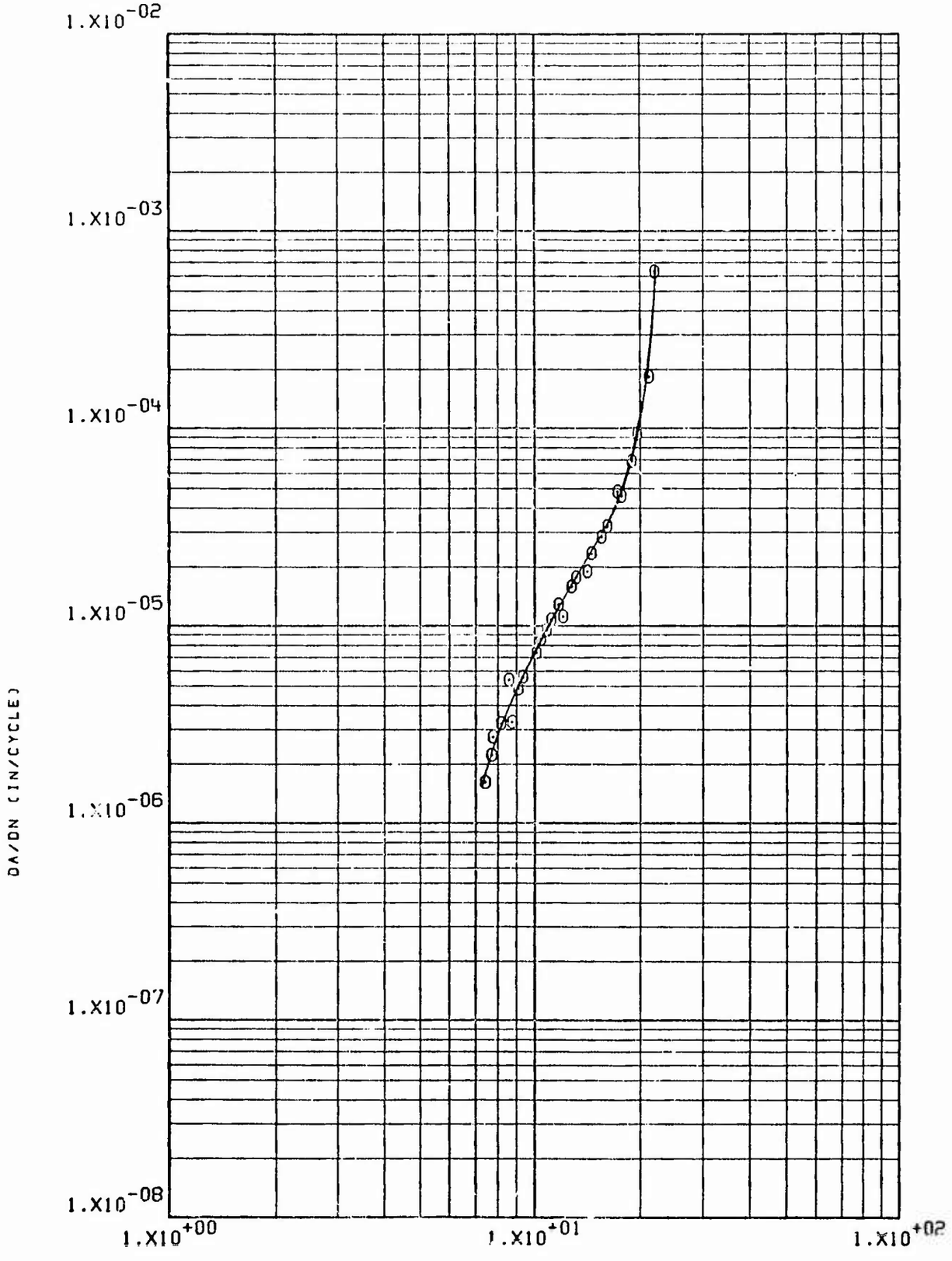

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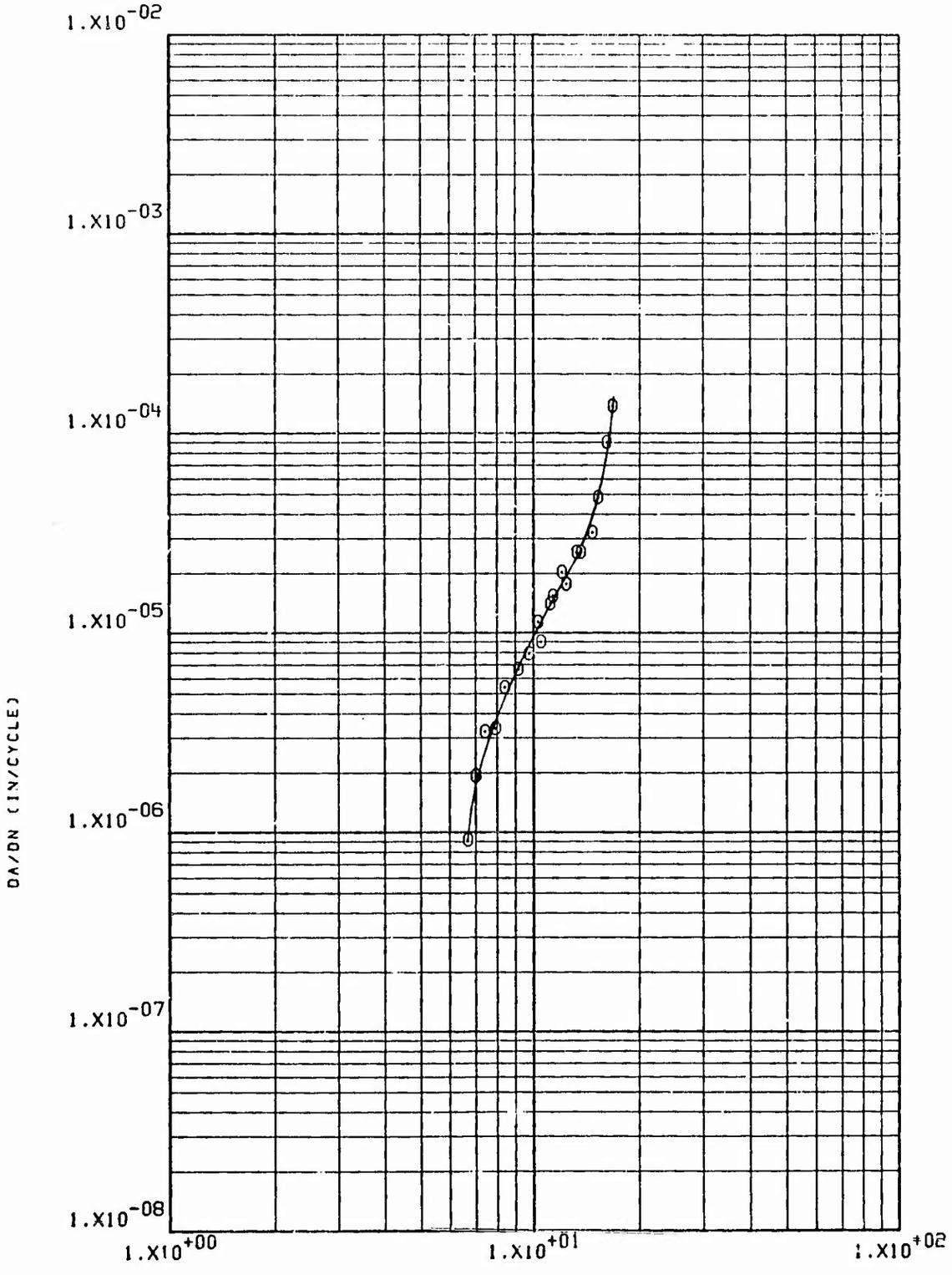
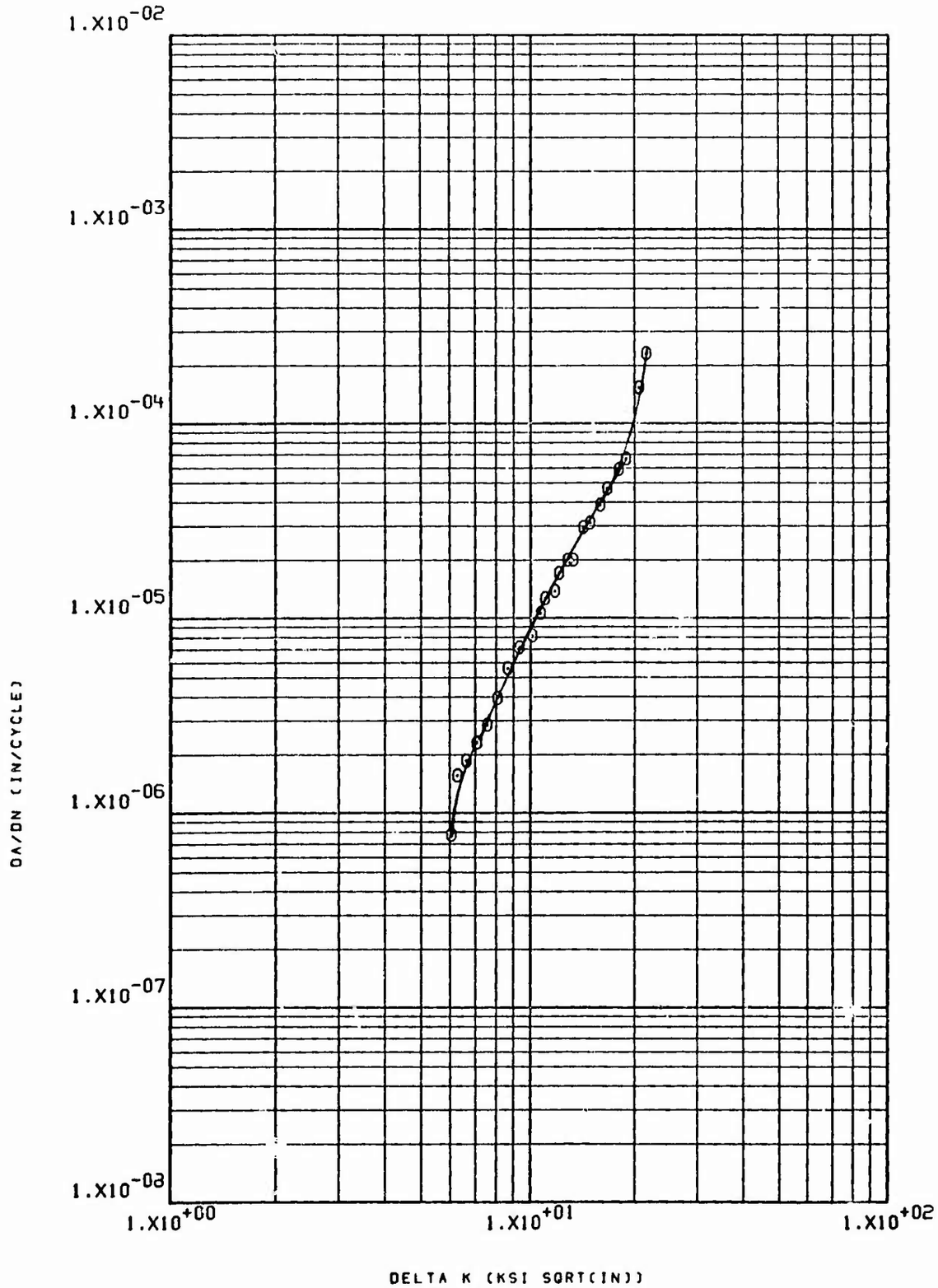


3 NWR 8-52 2024-T851 LHA RT 360CPM R=.08



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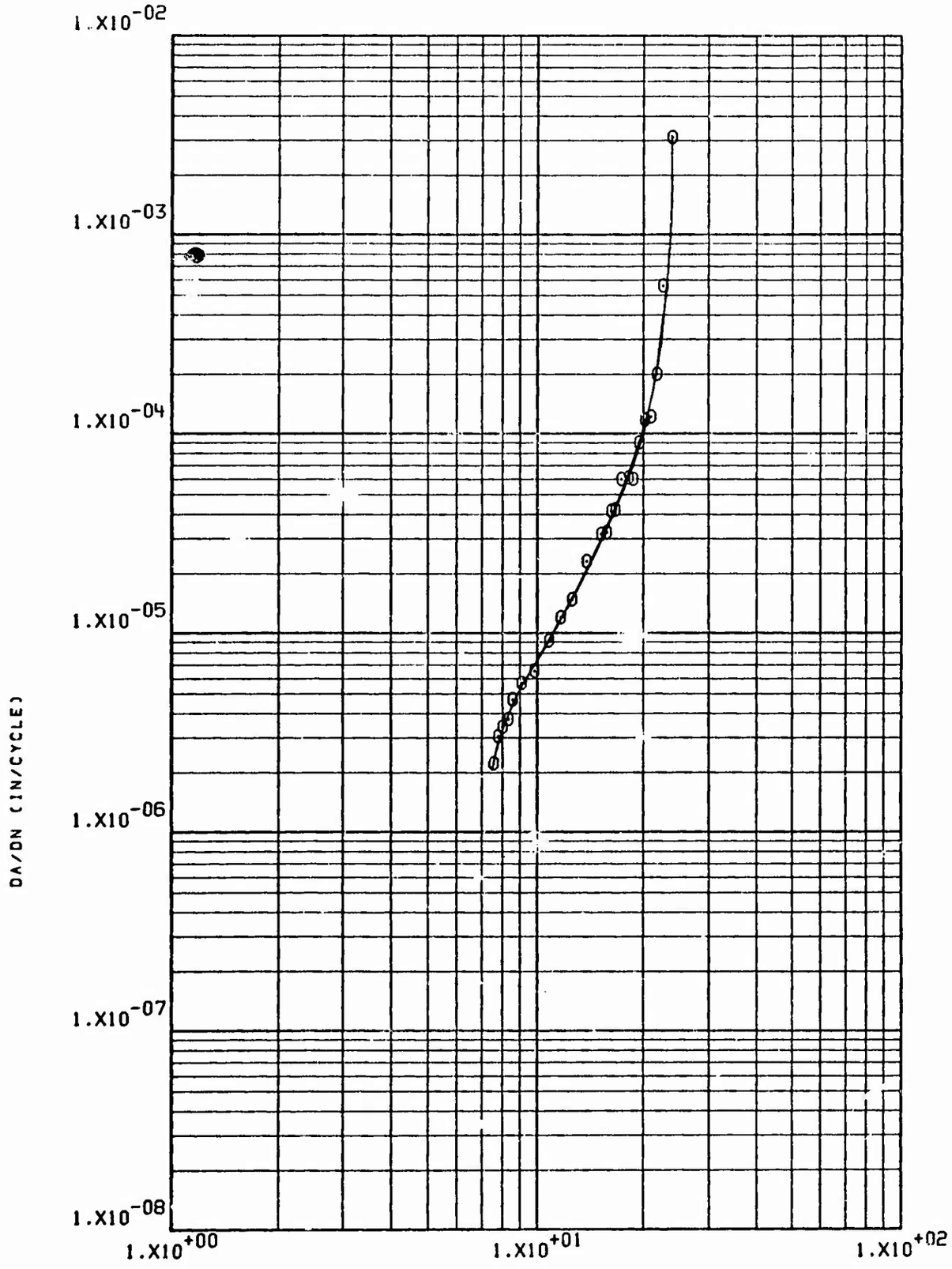

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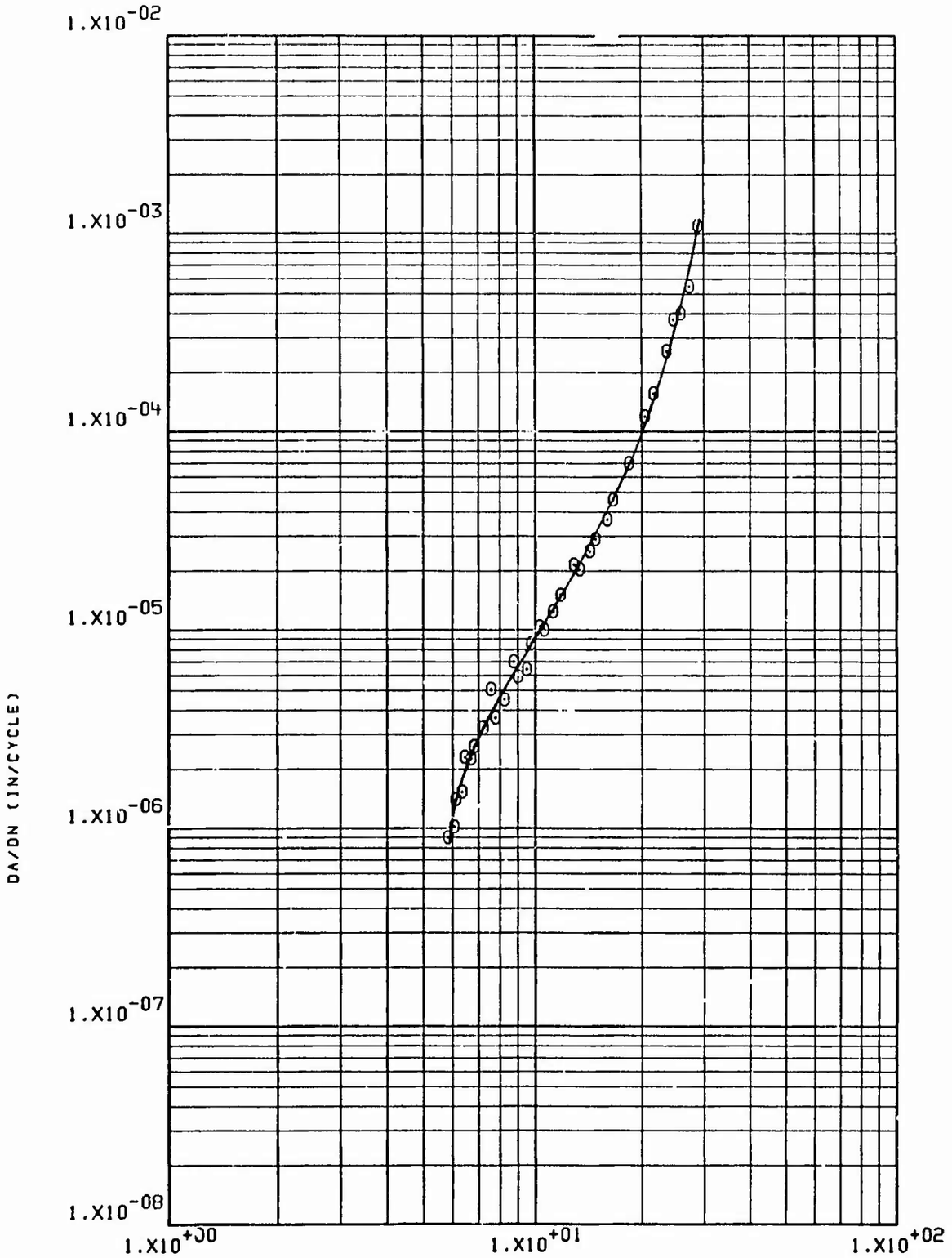

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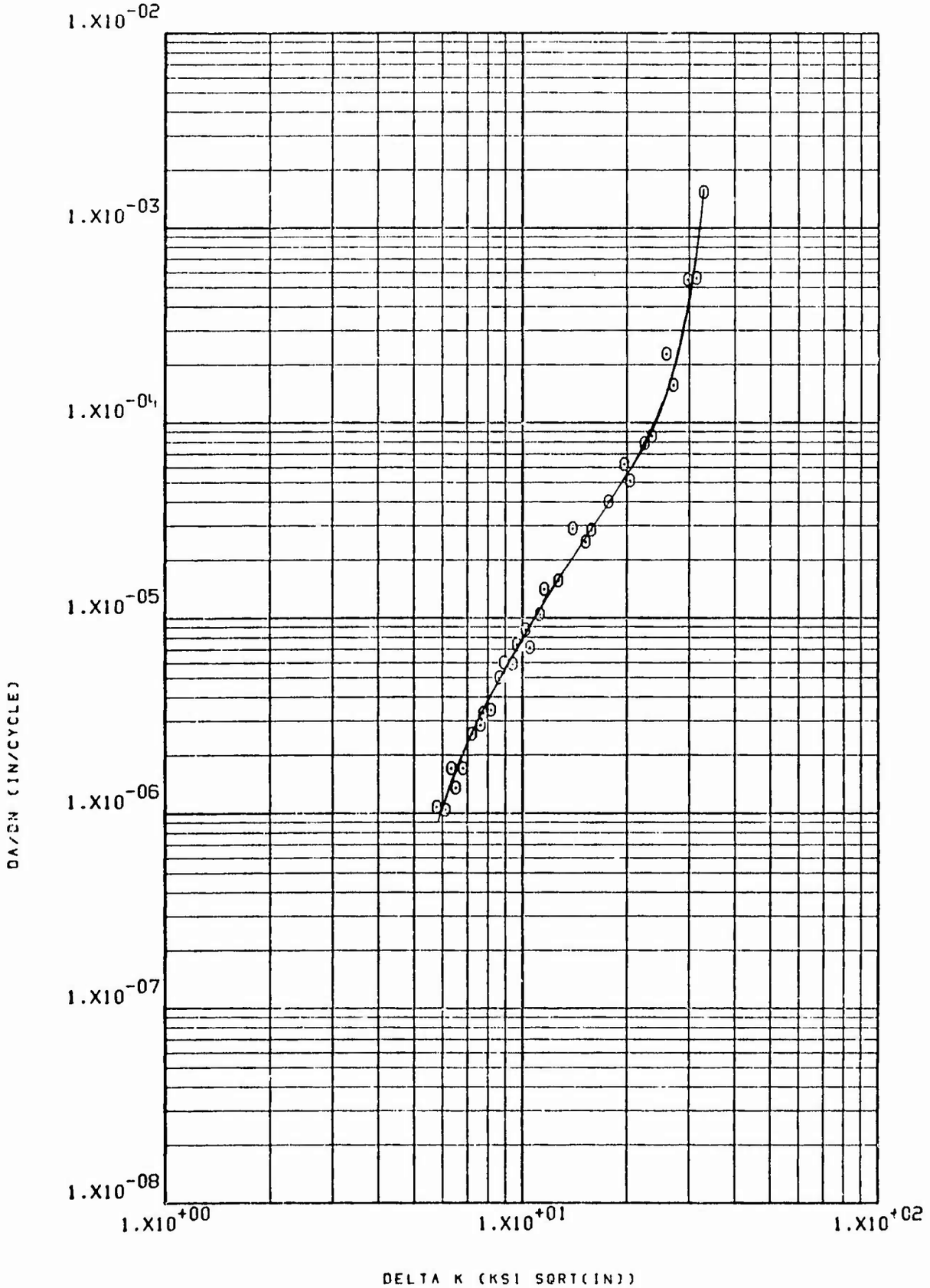
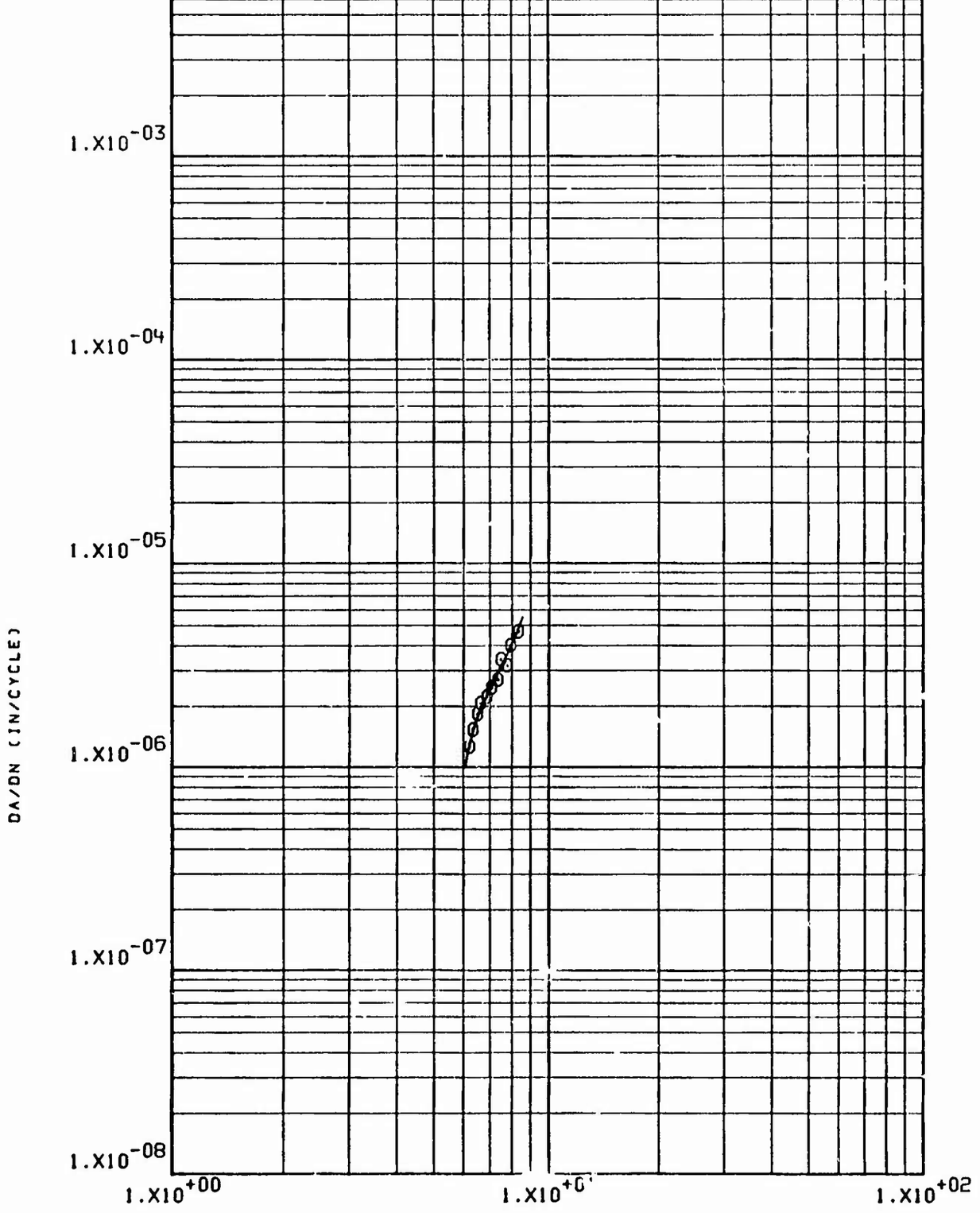


4 NRW 9-12 2219-T-851 LHA R.T. 60CPM P=.08



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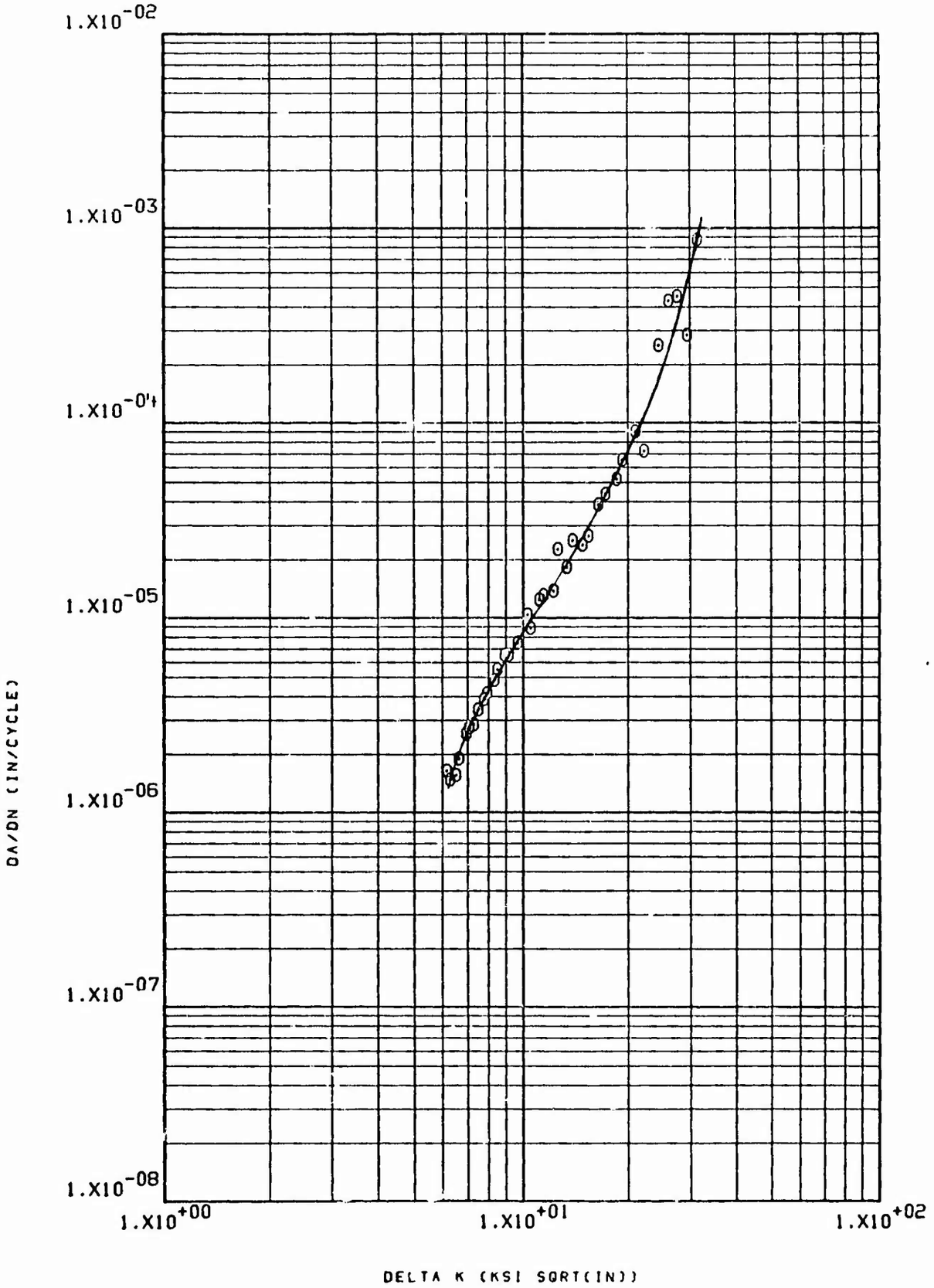

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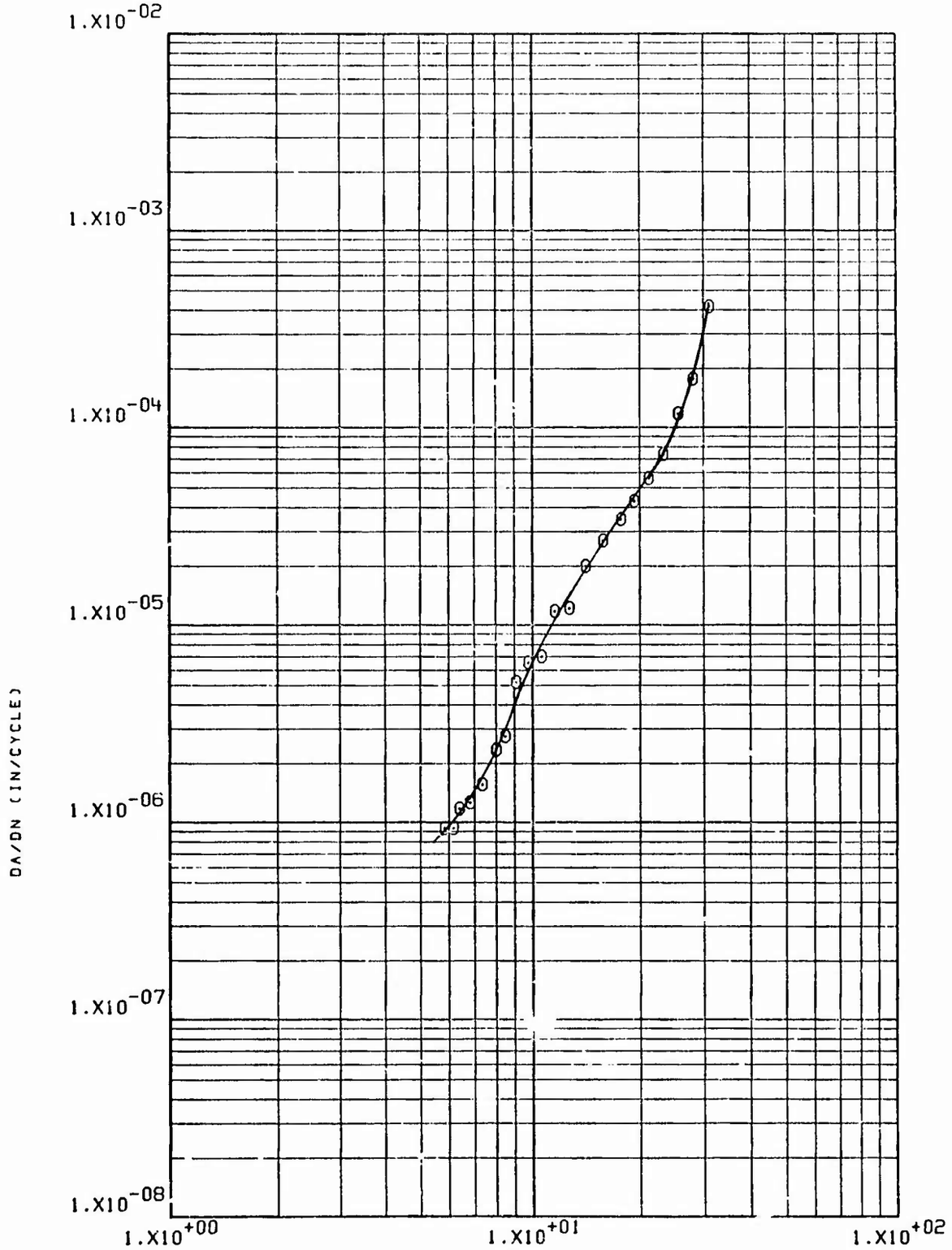

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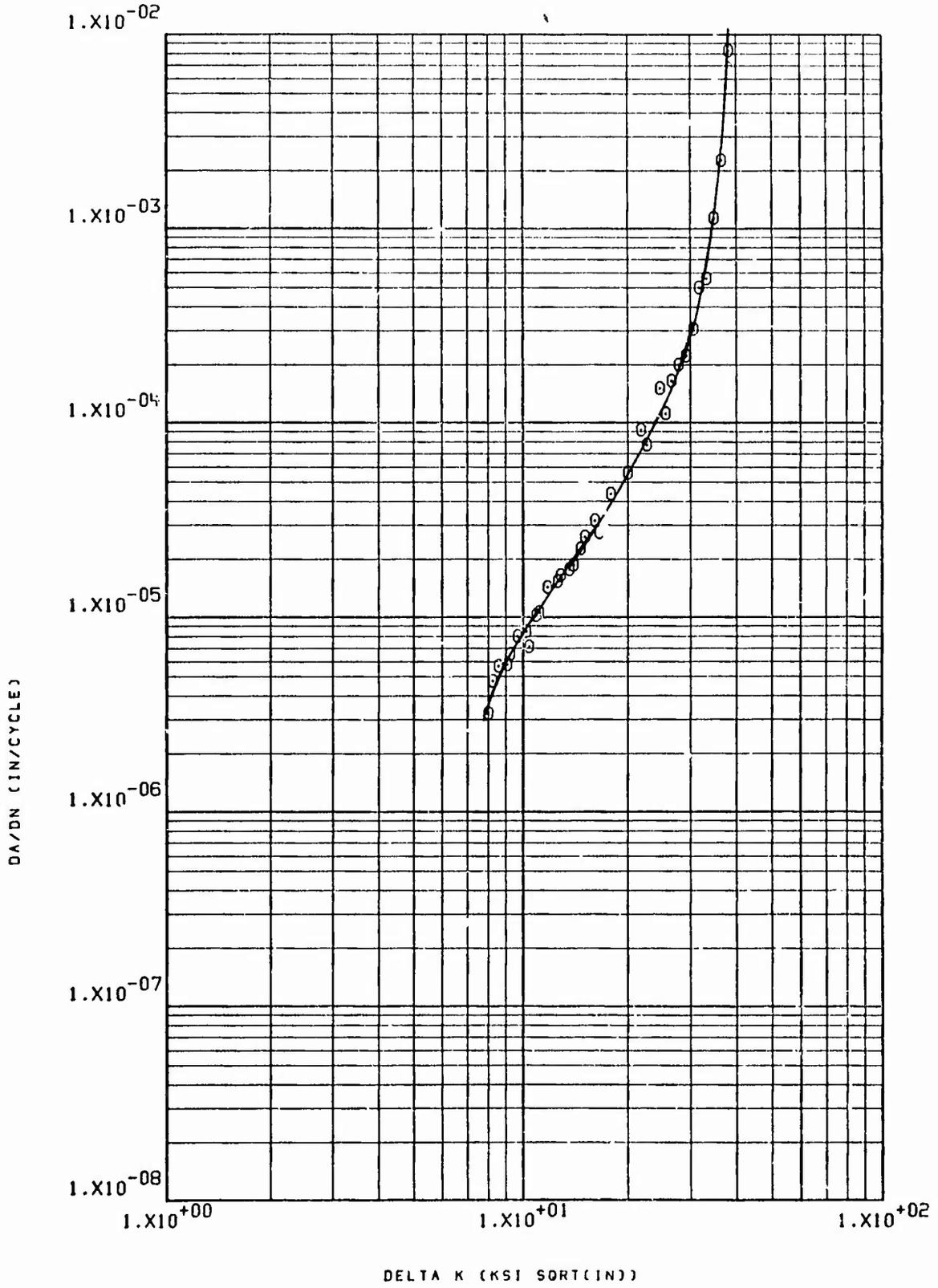

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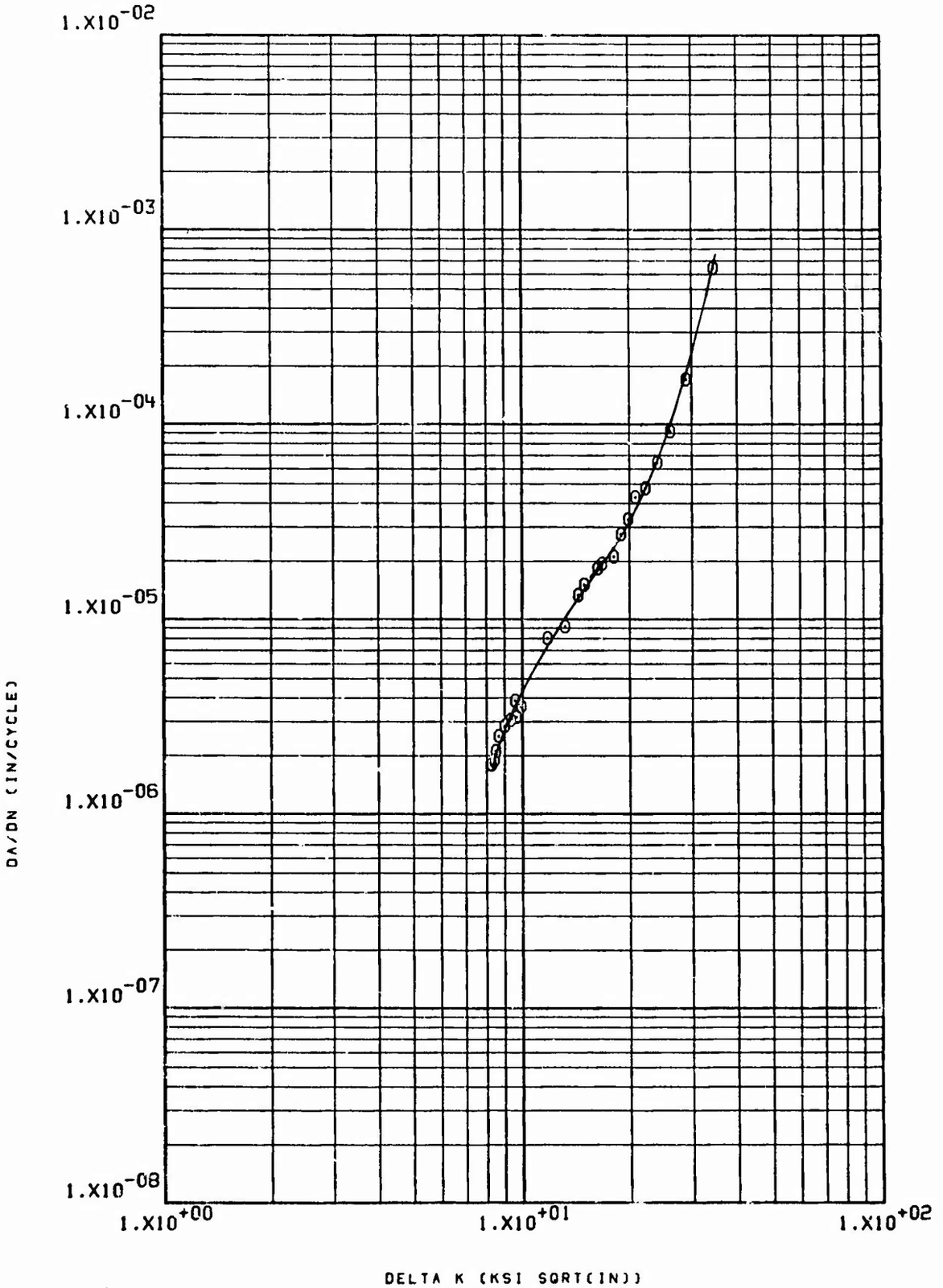

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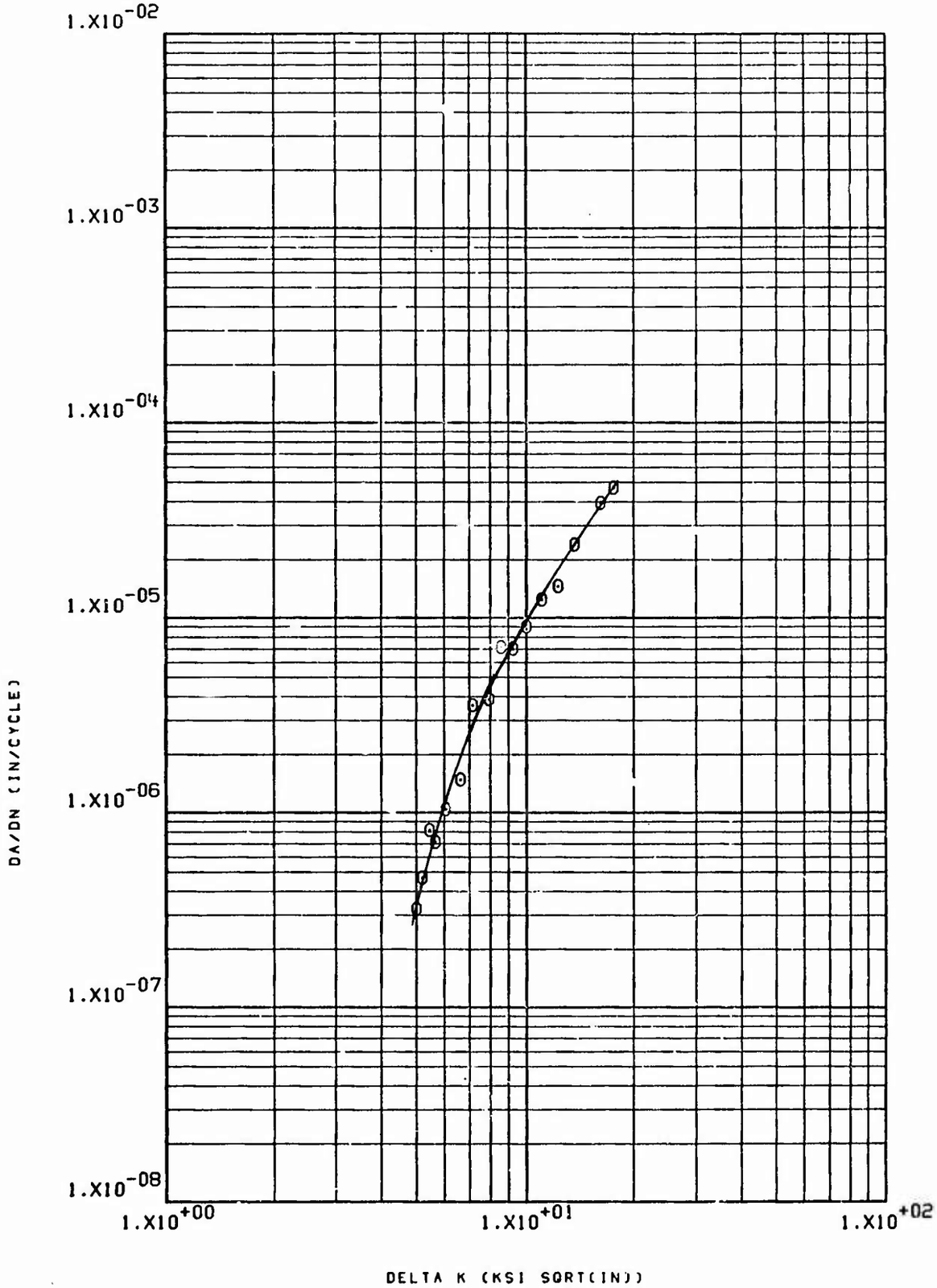
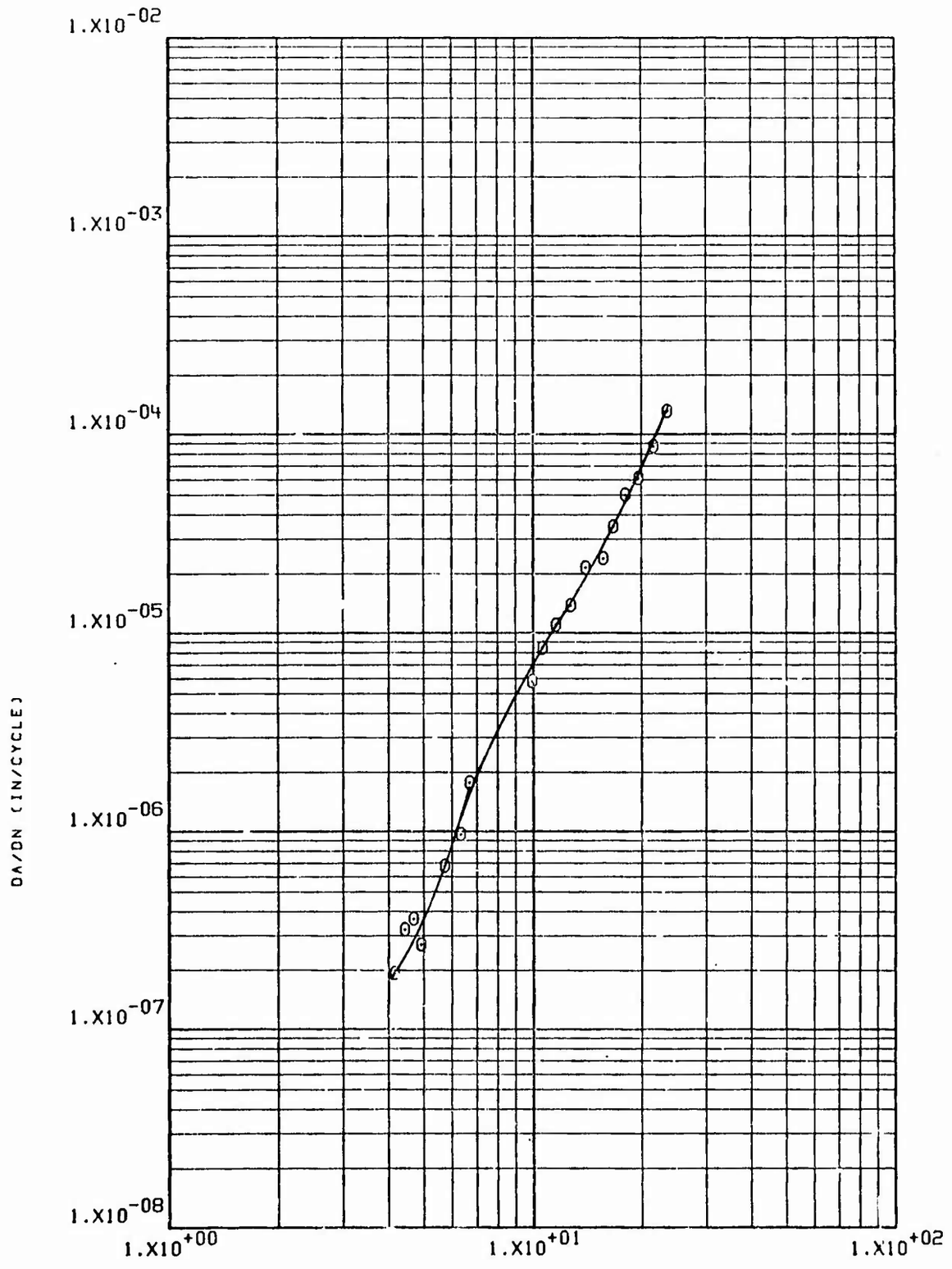
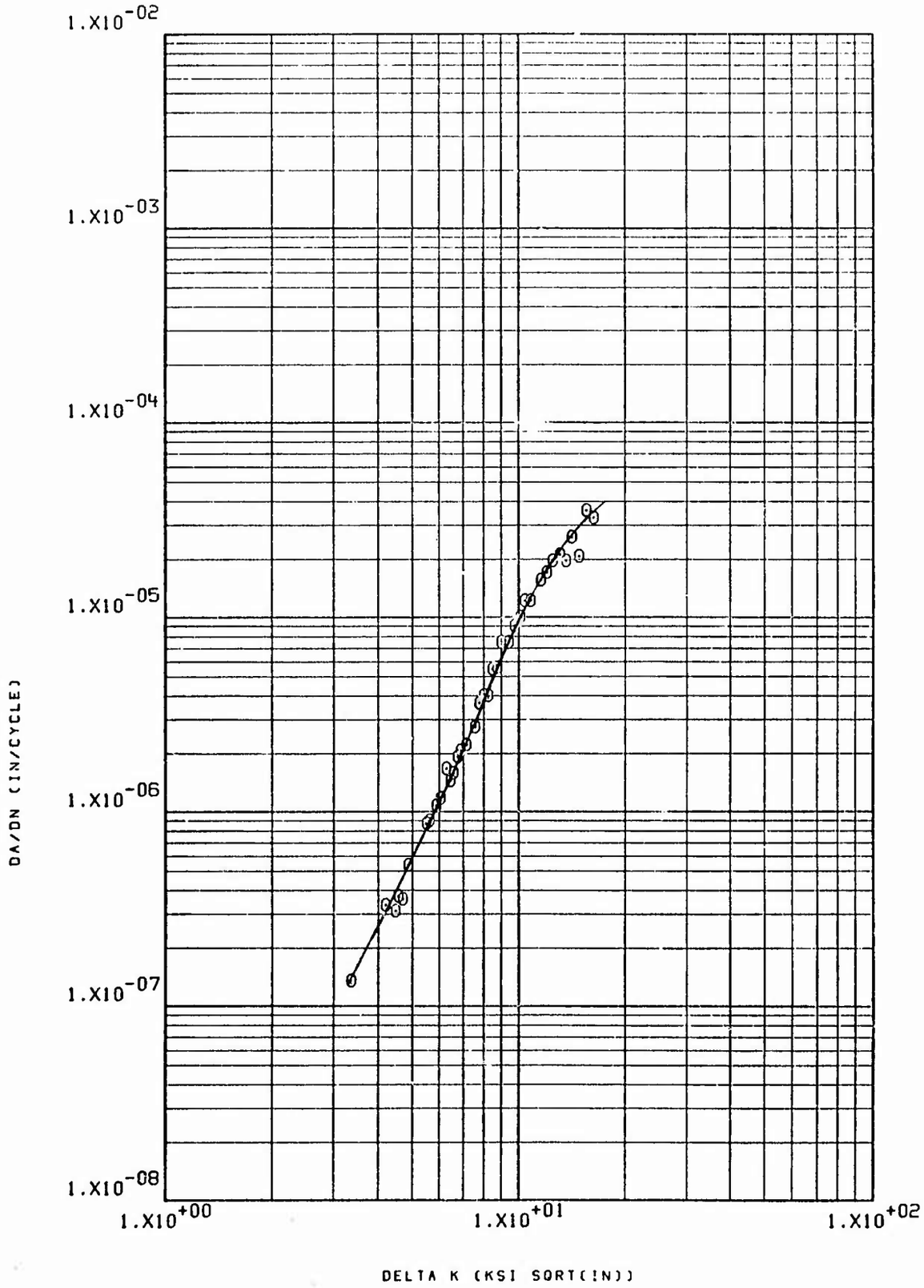


5 NRW 17-1 7075-T7651 L.H.A. R.T. 360CPM R=.08



5 NRW 17-4 7075-T7351 L.H.A. R.T. 360CPM R=.08



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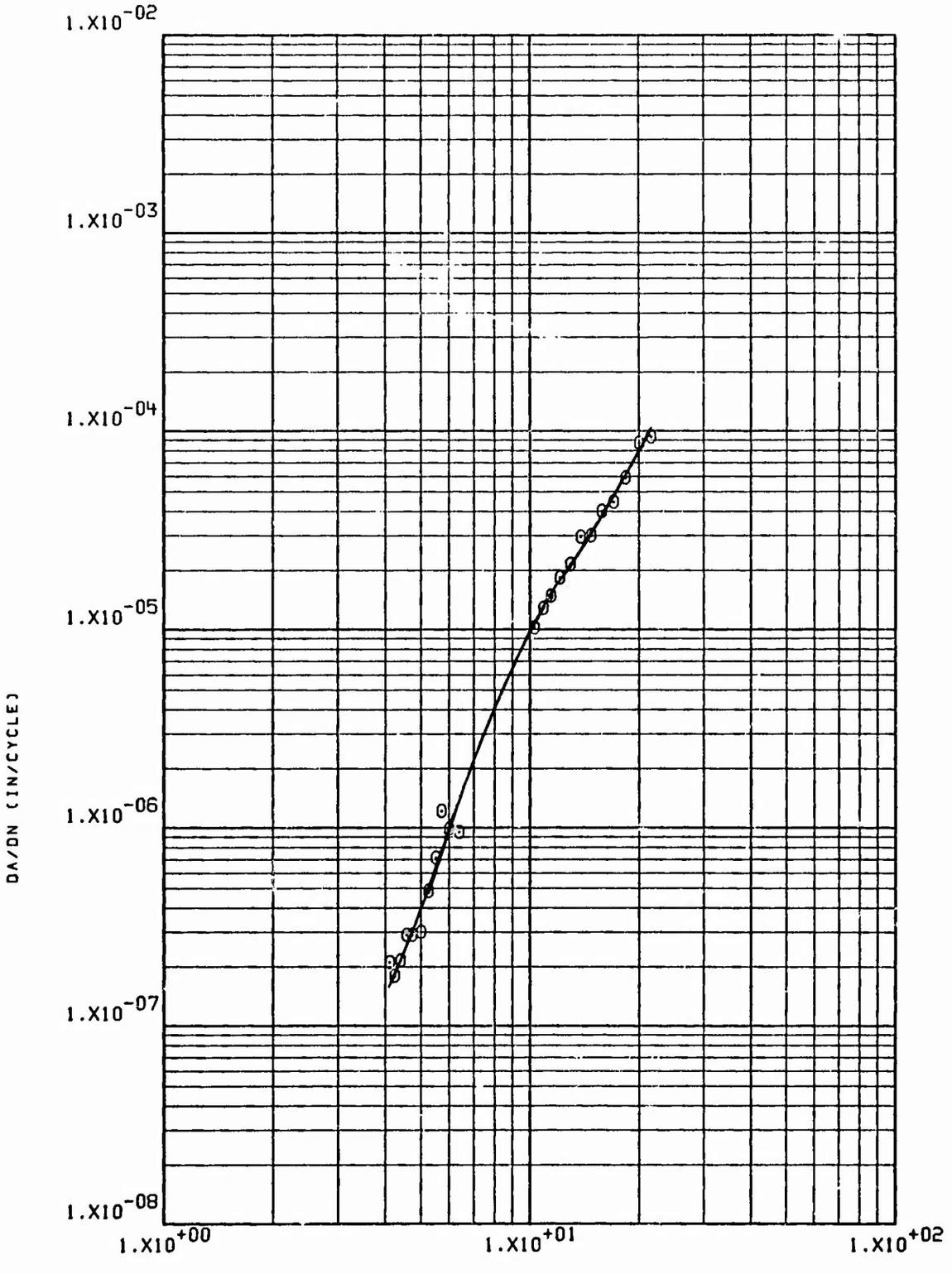

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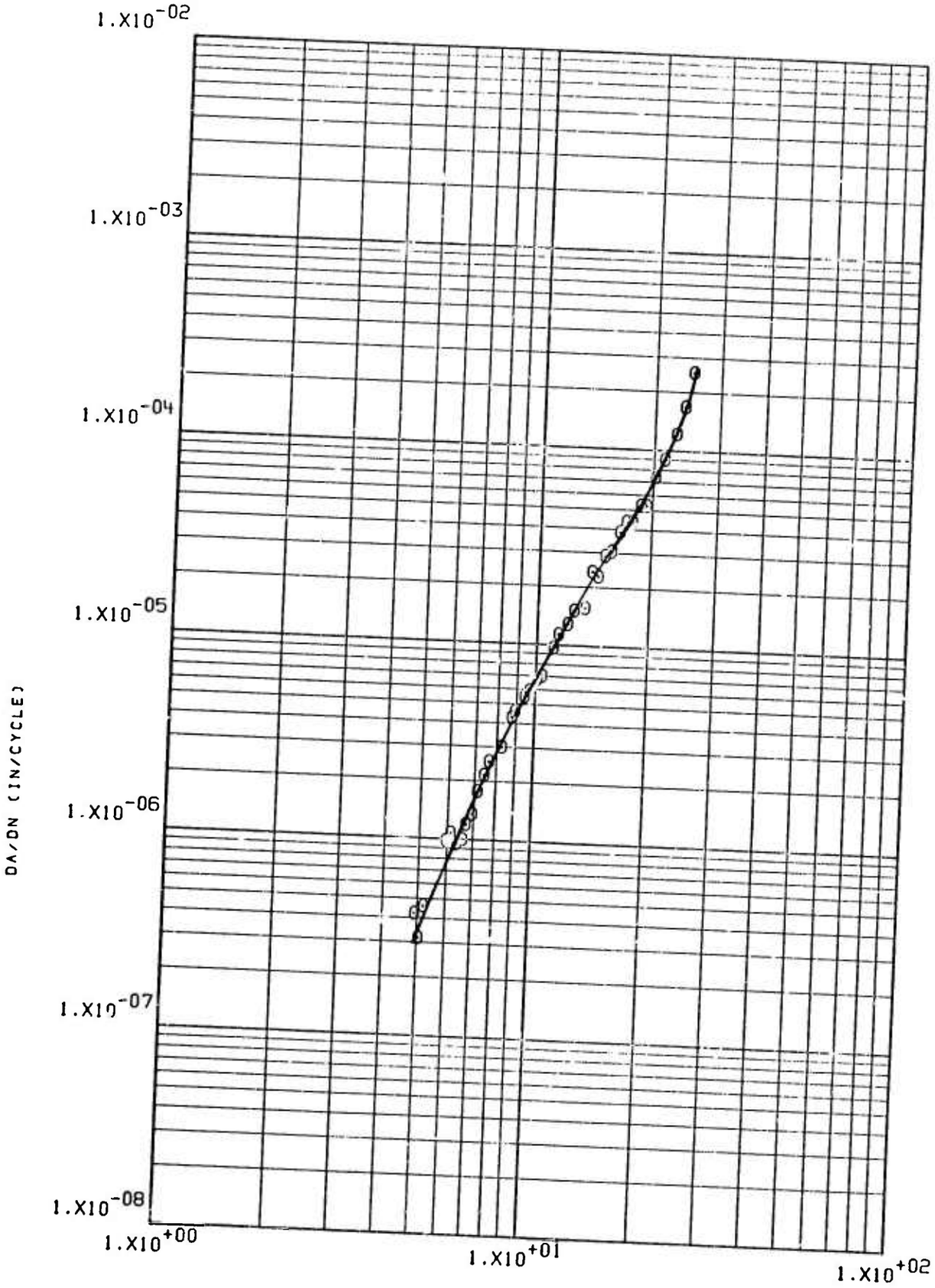

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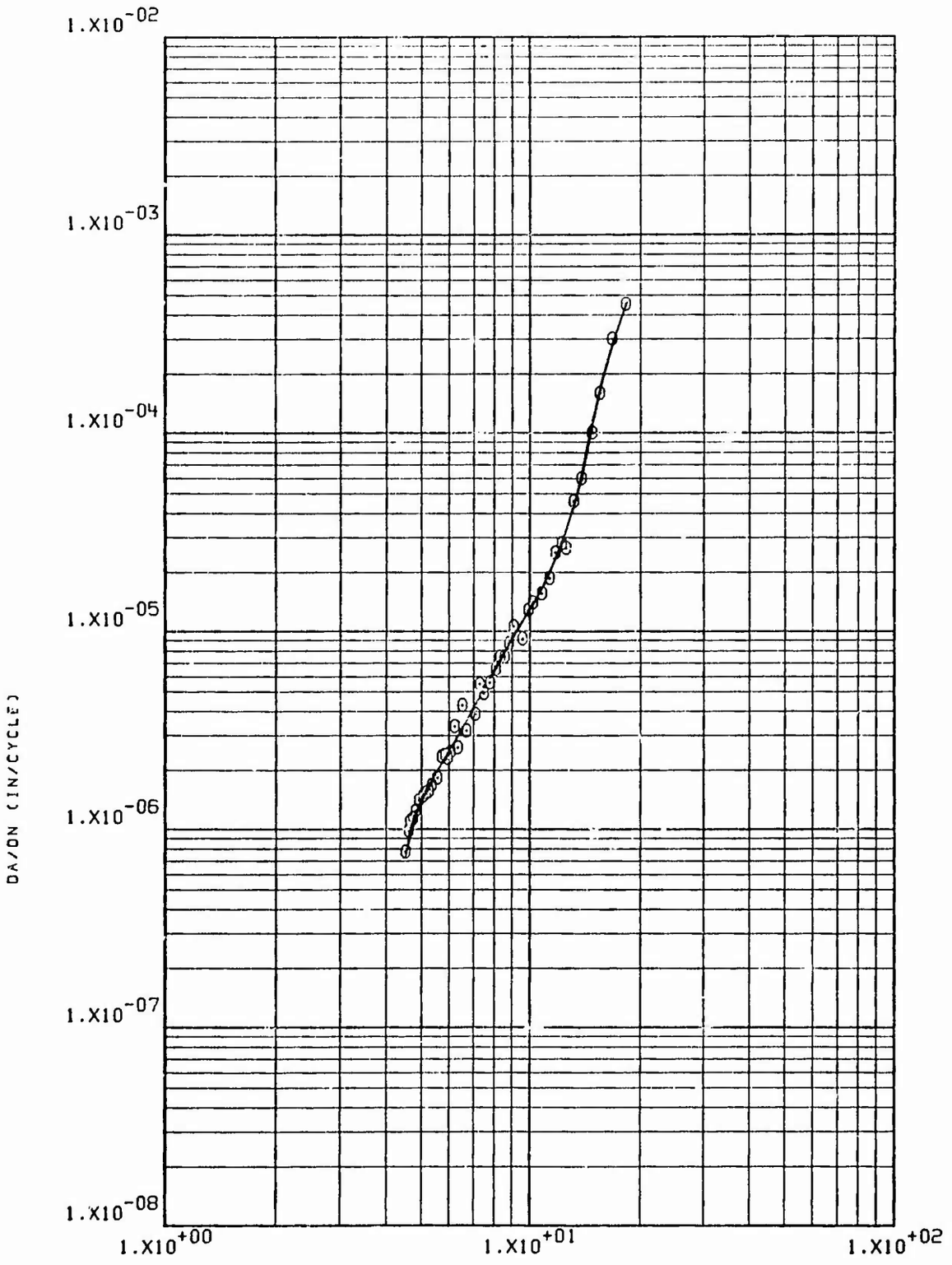

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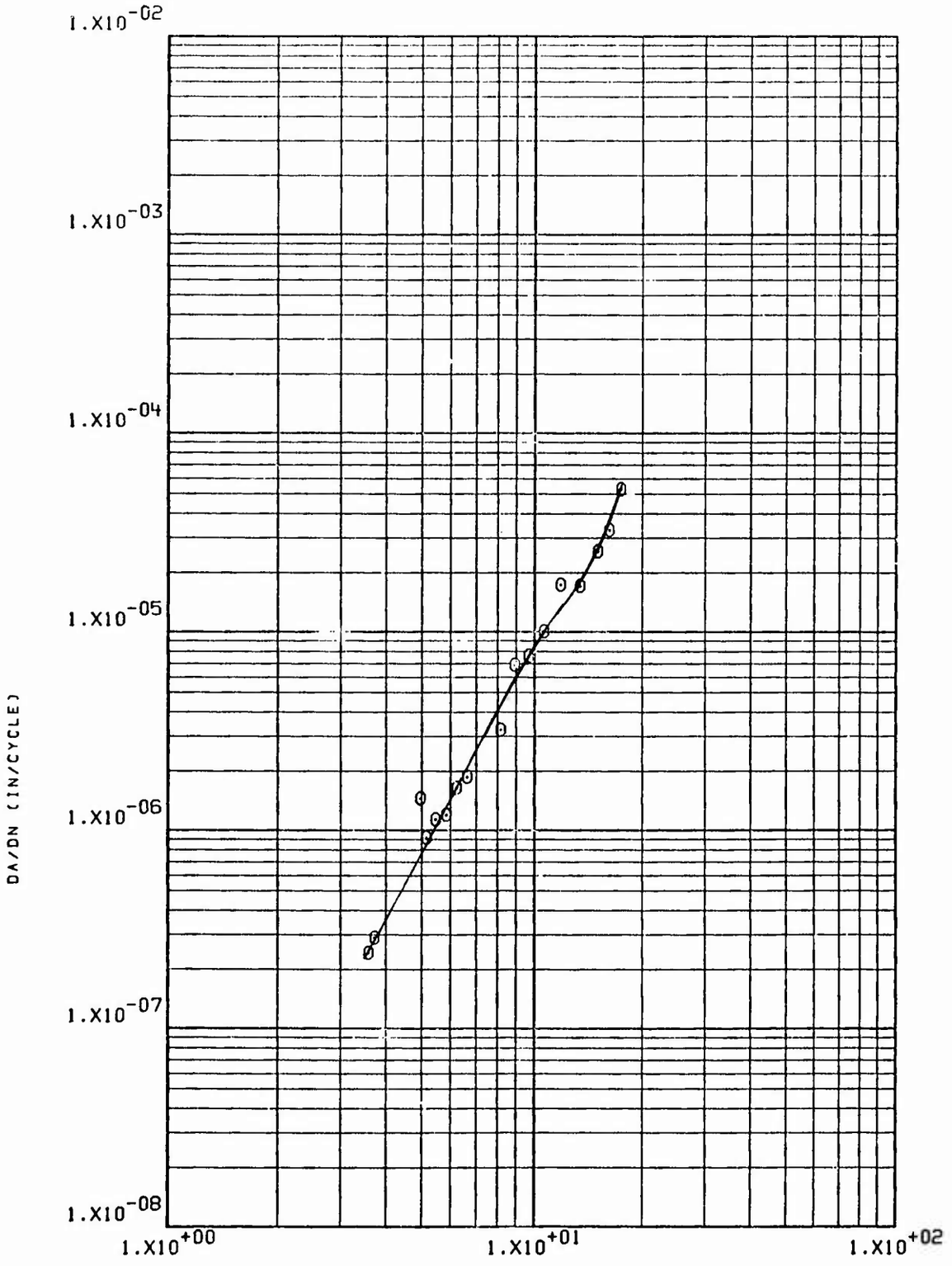

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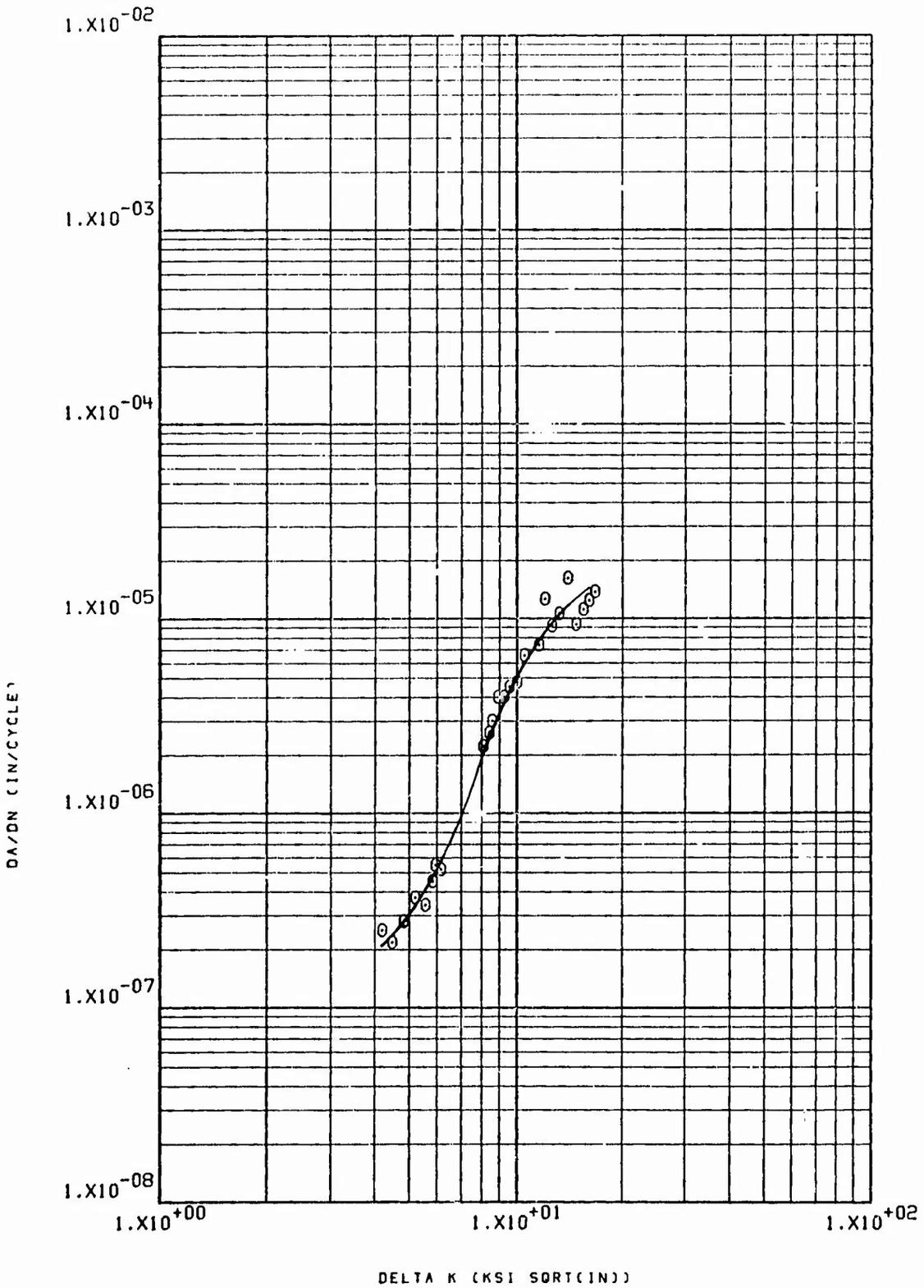
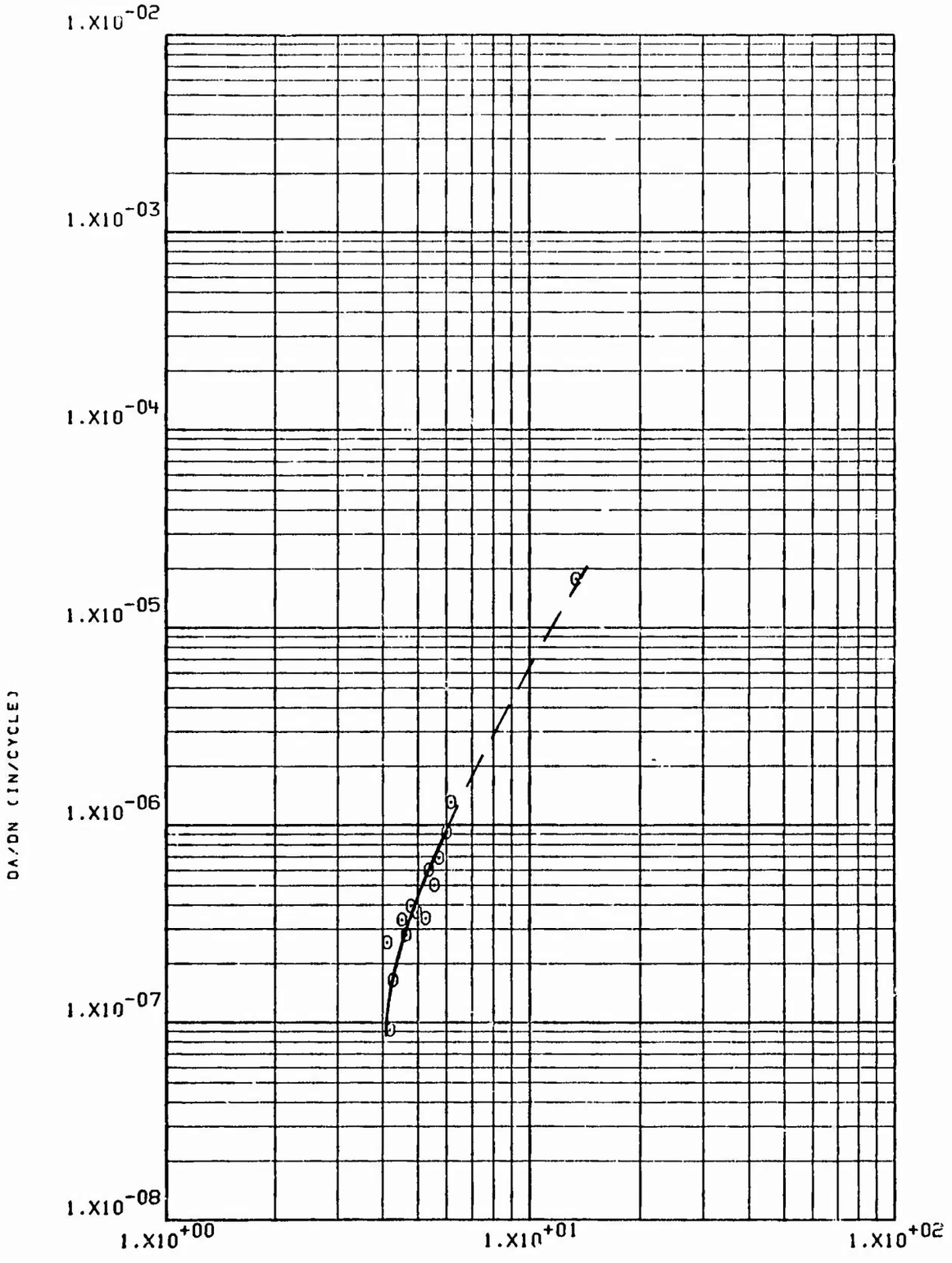


5 NRW 17-14 7075-T7351 LHA RT R=.08 360CPM



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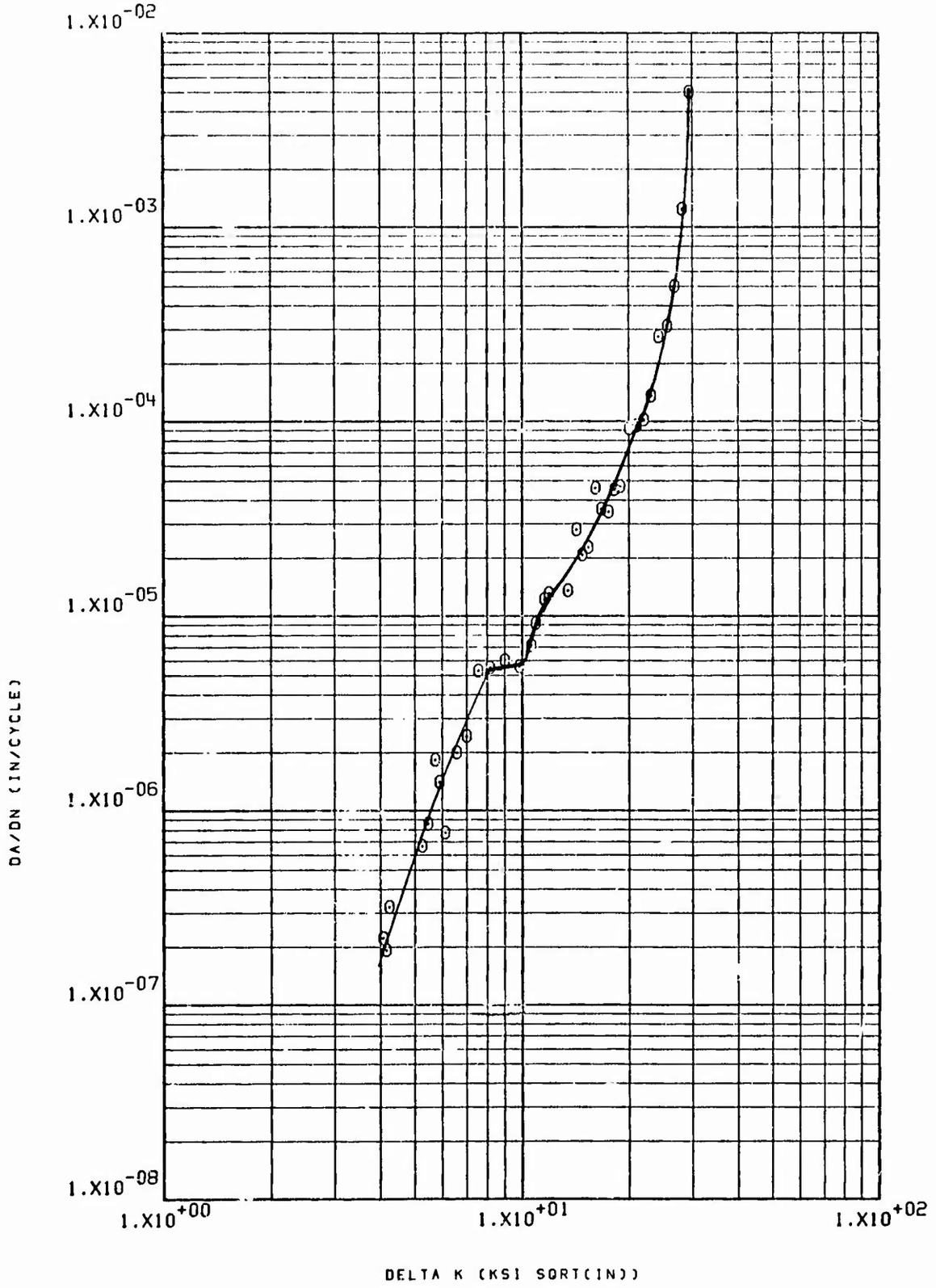

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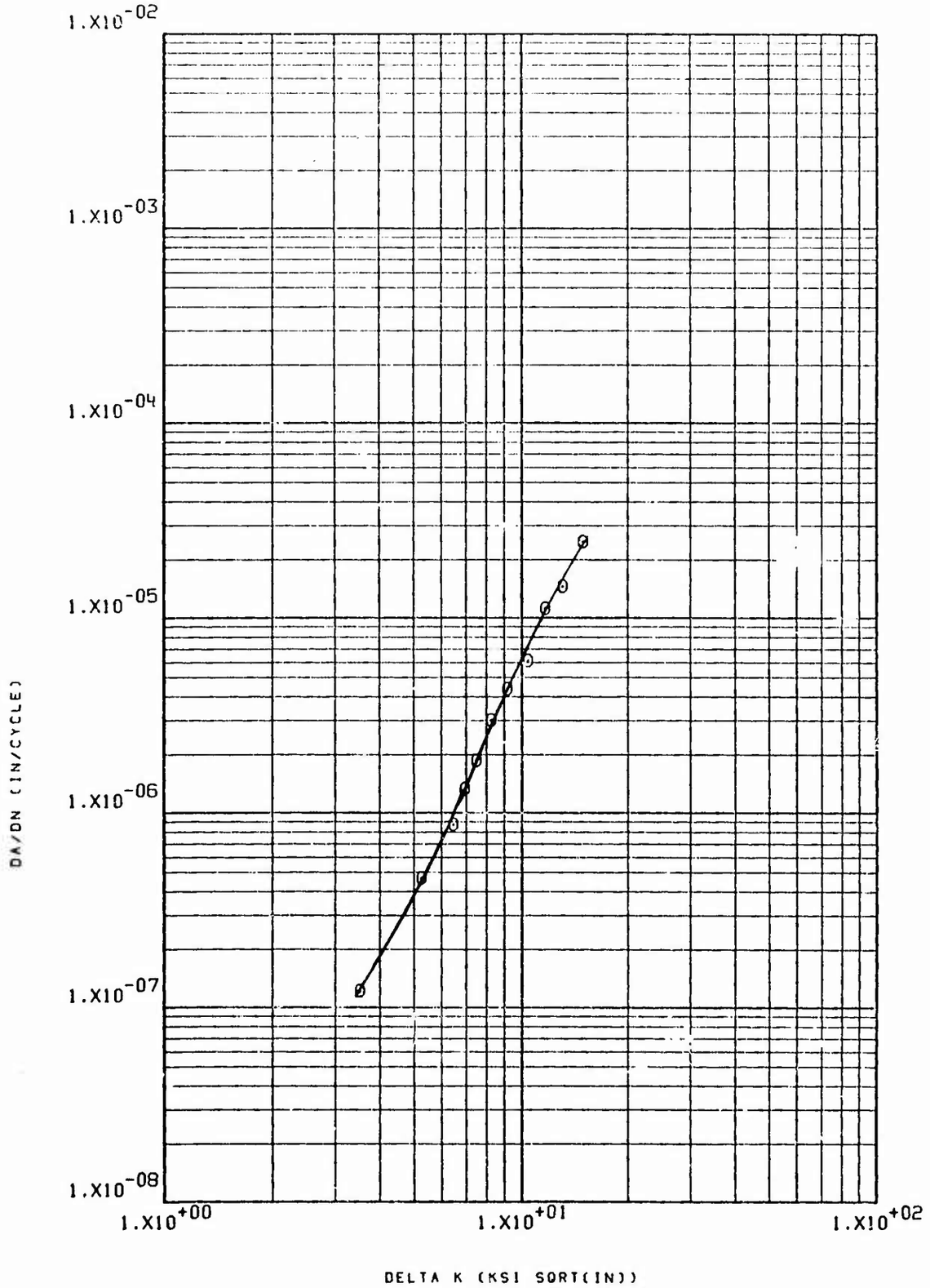

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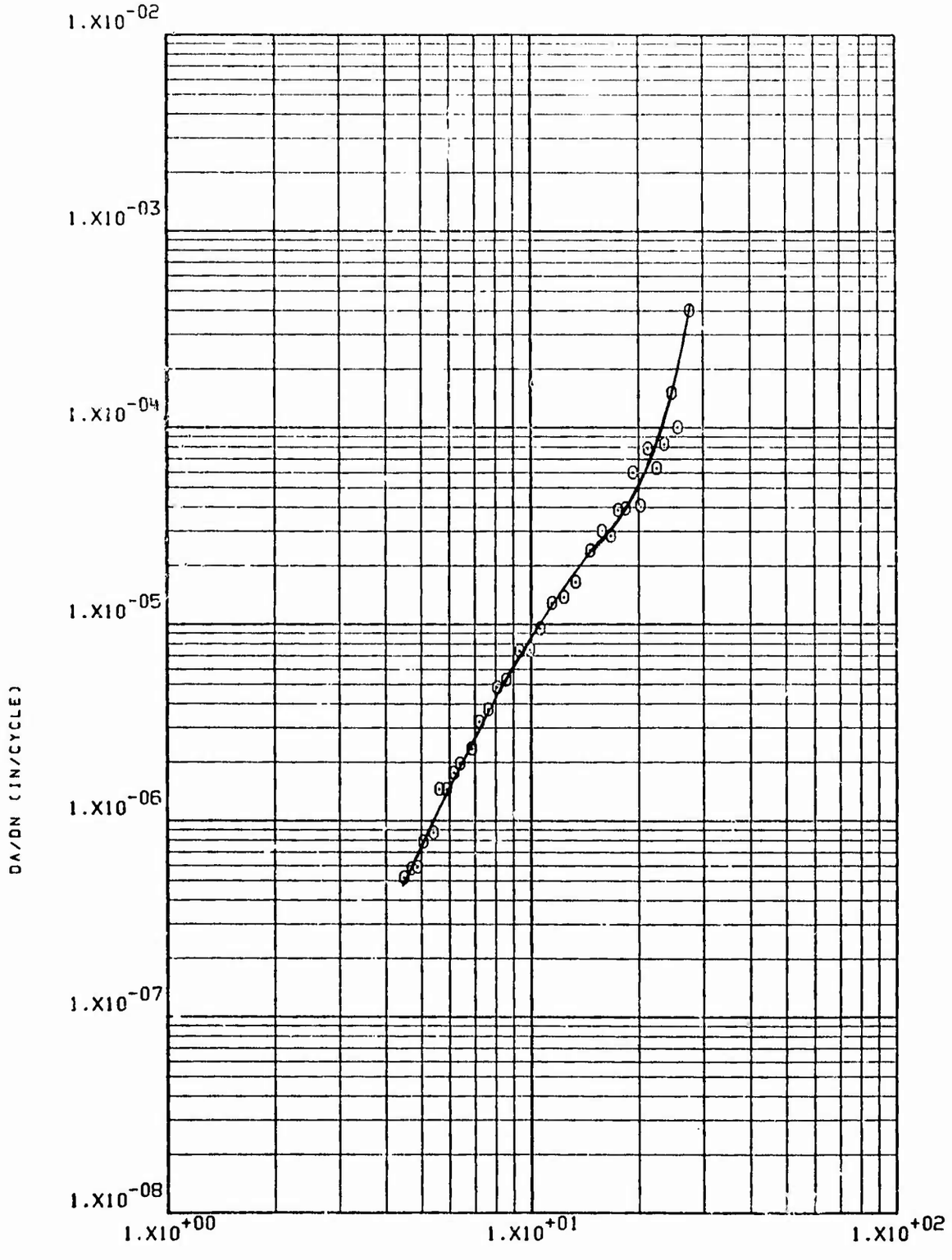

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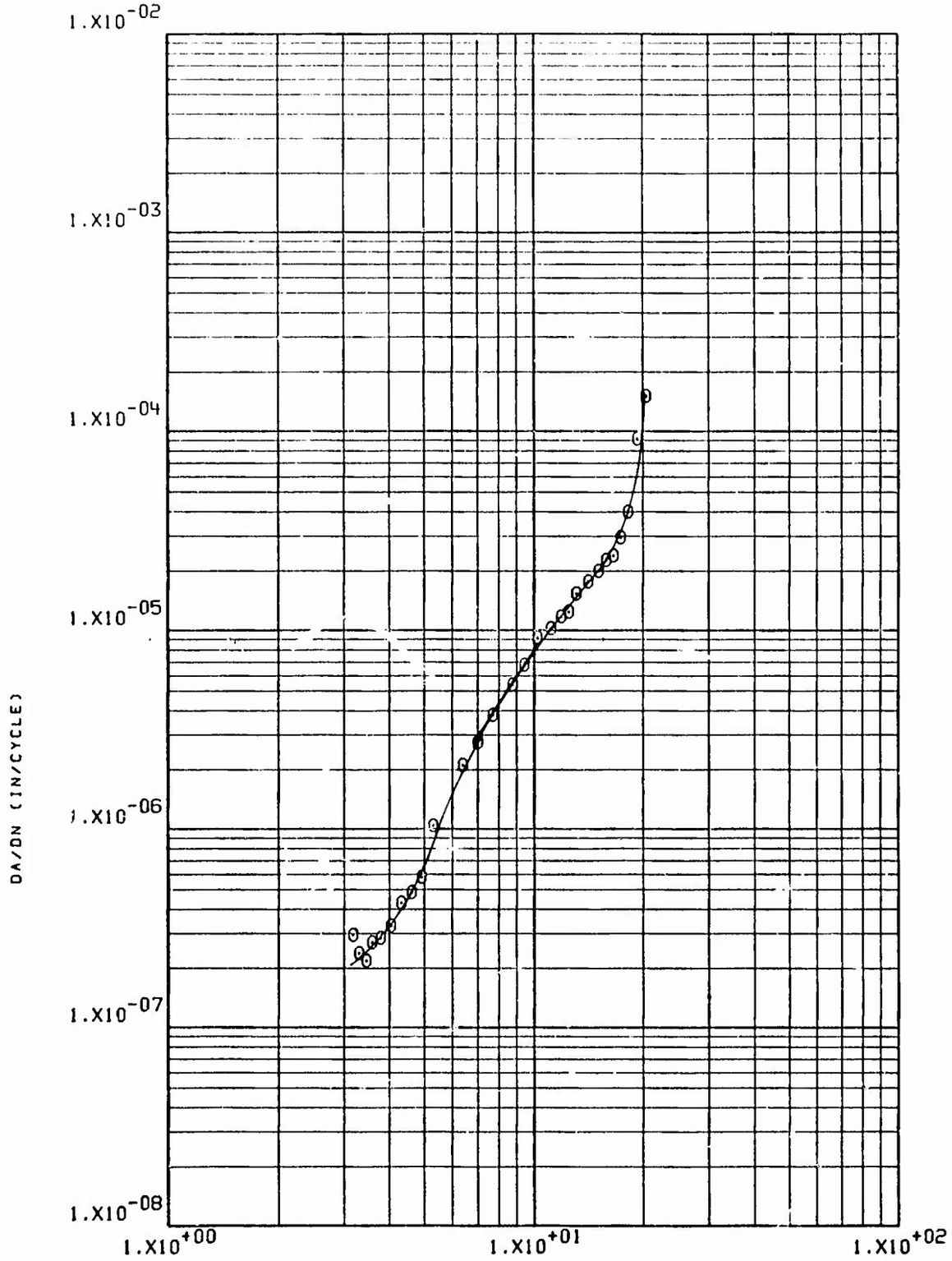
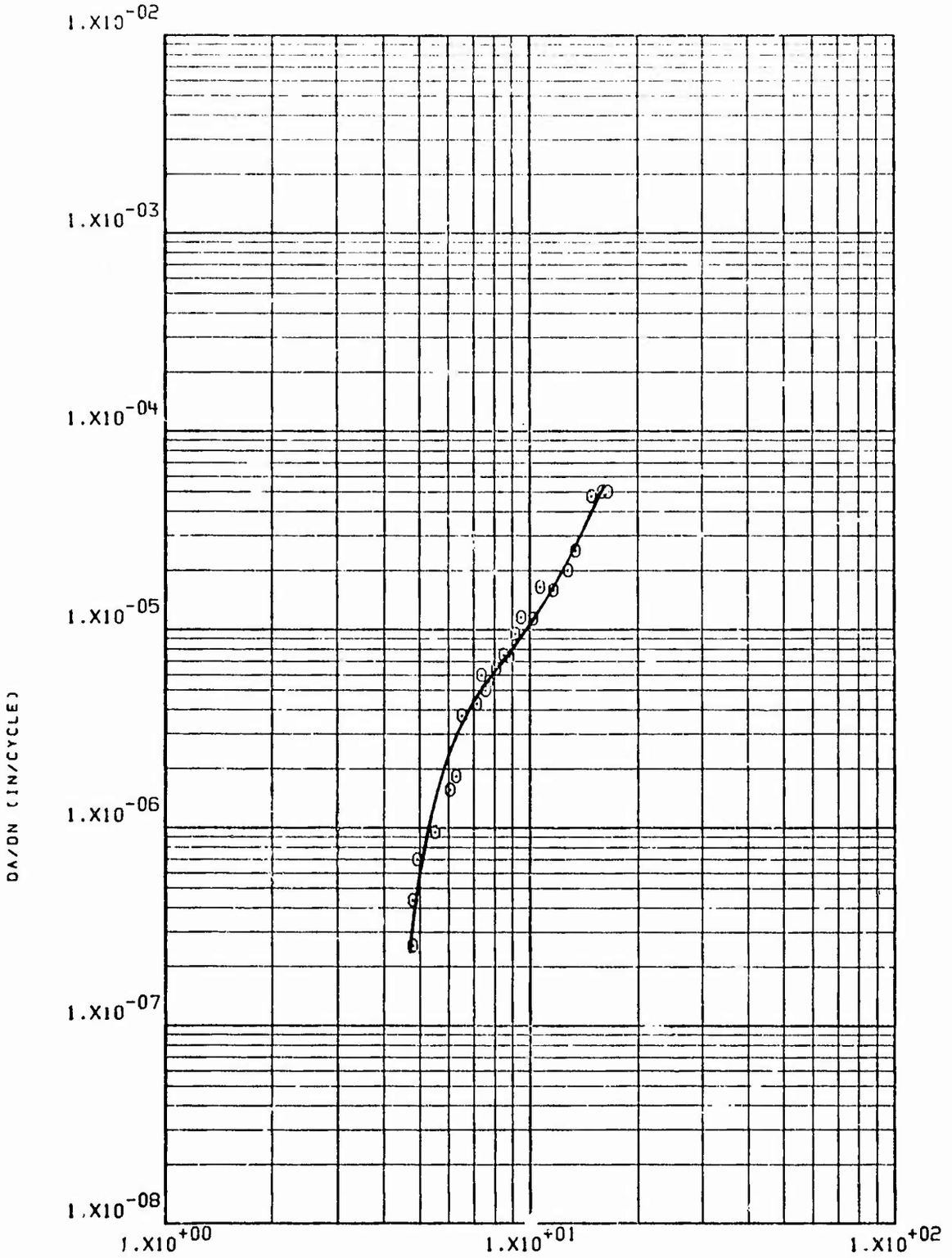
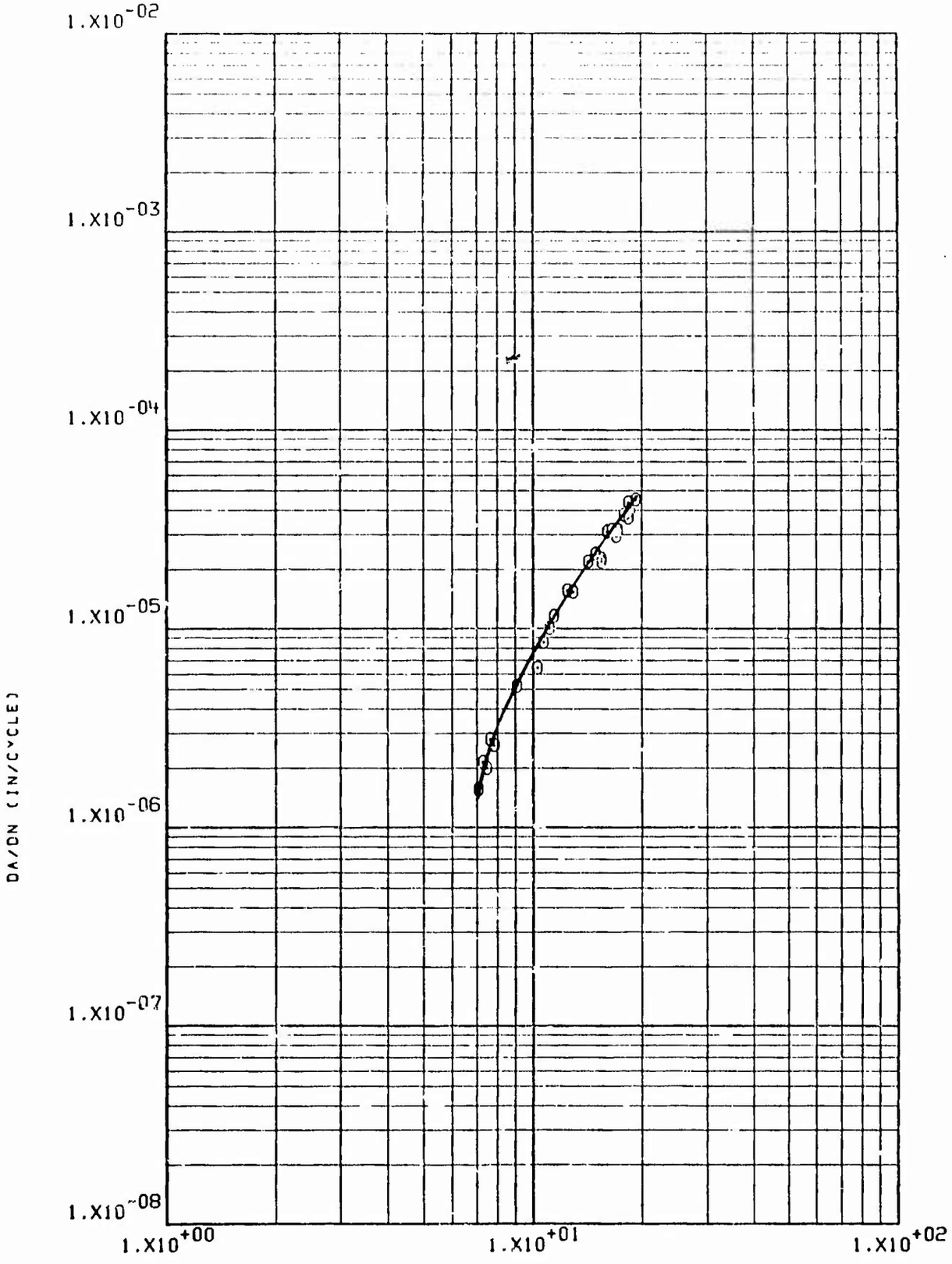


7 NRW 27-13 2219-T851 L.H.A. R.T. 360CPM R=.5



7 NRW 27-19 2219-T851 STW RT R=.50 60CPM



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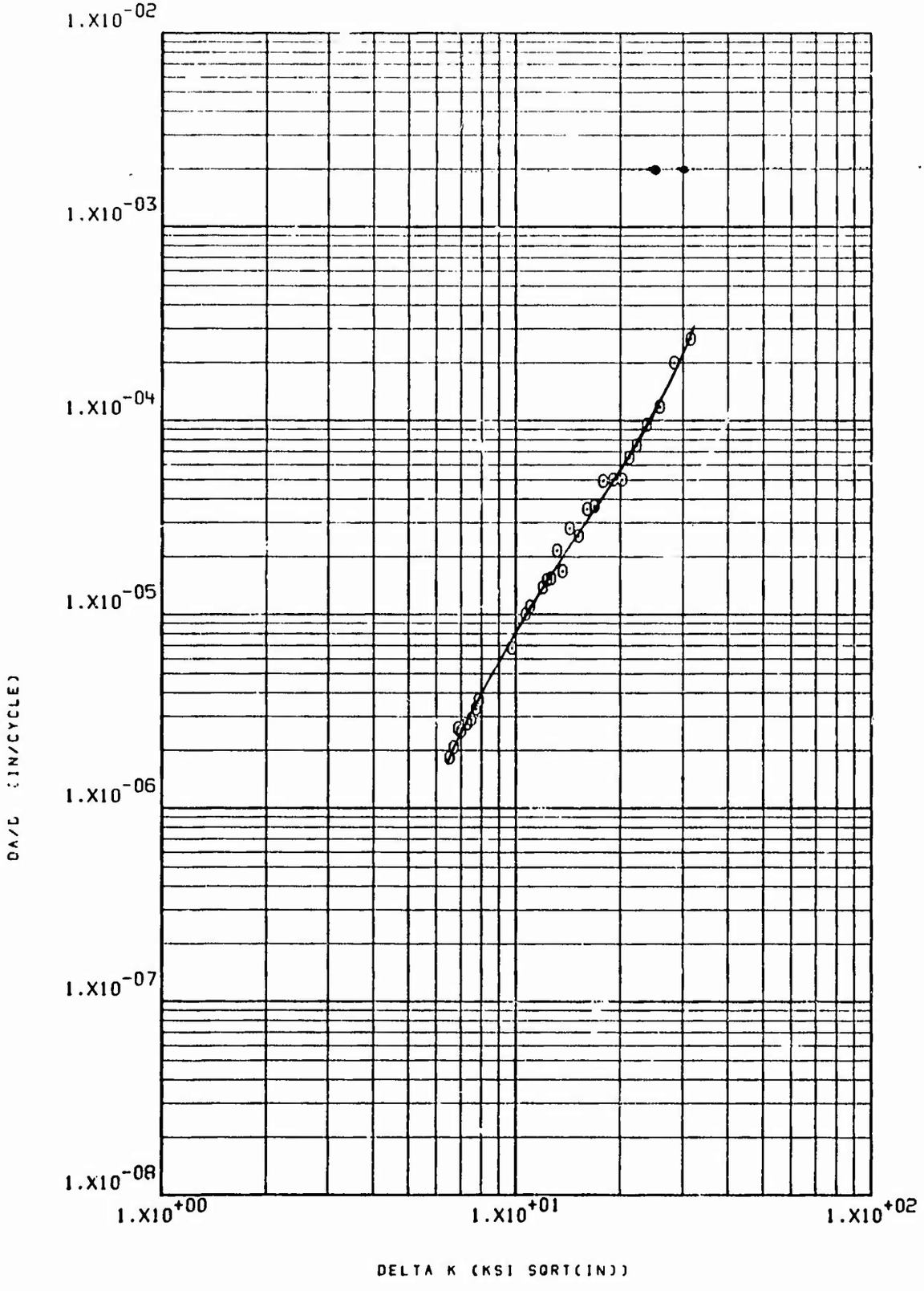
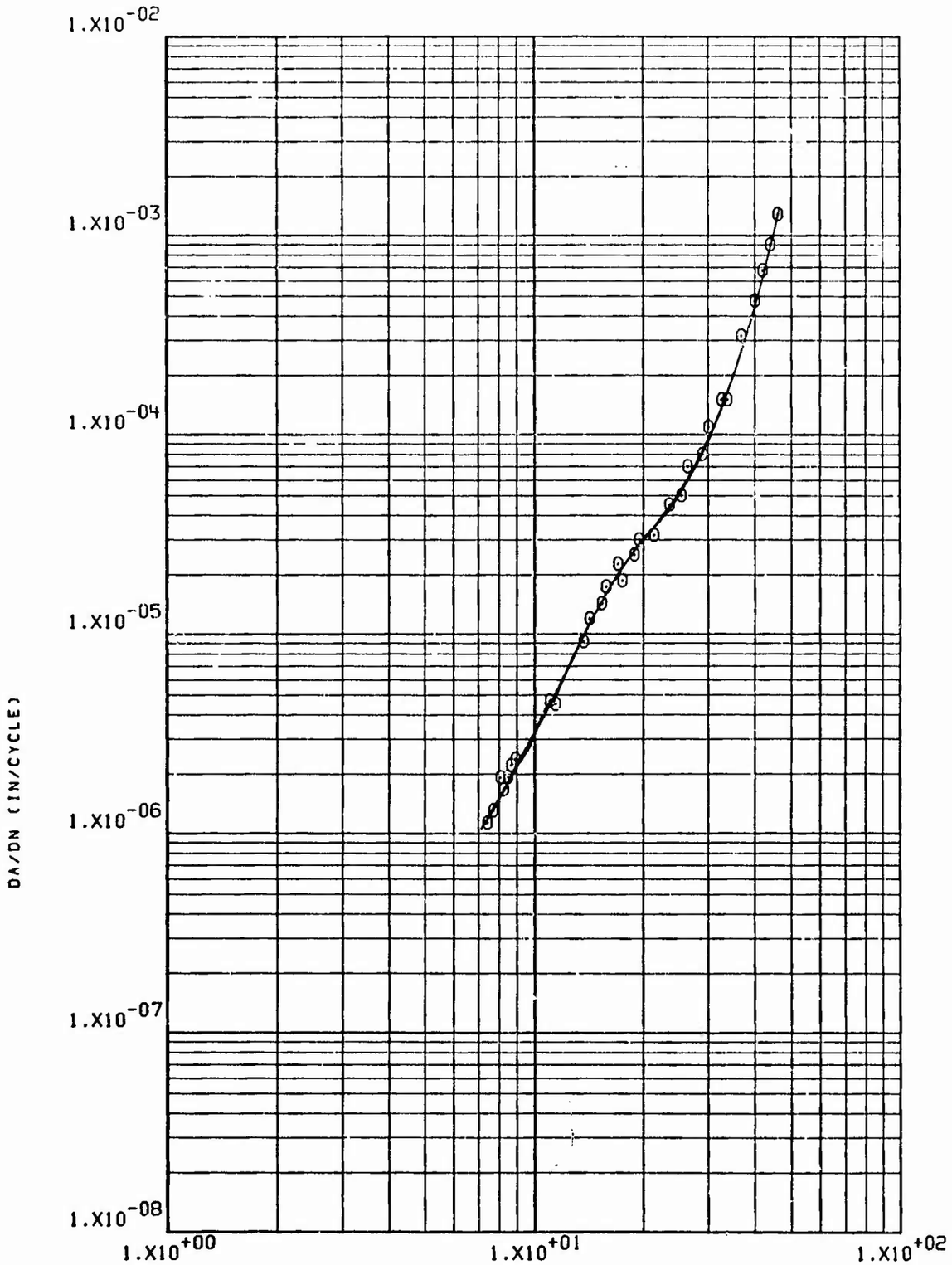


7 NRW 27-24 2219-T851 LHA 265 .08 360CPM



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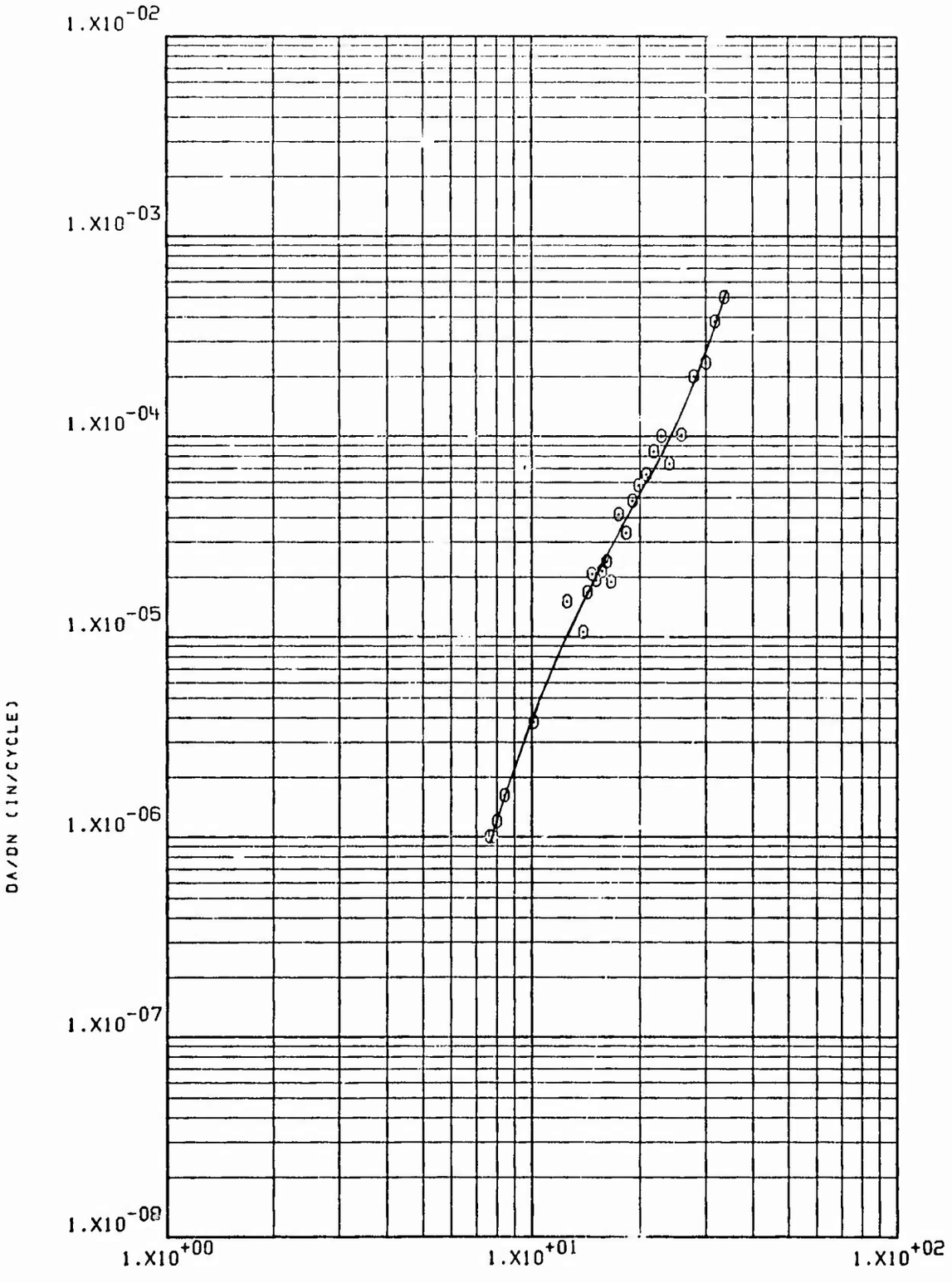

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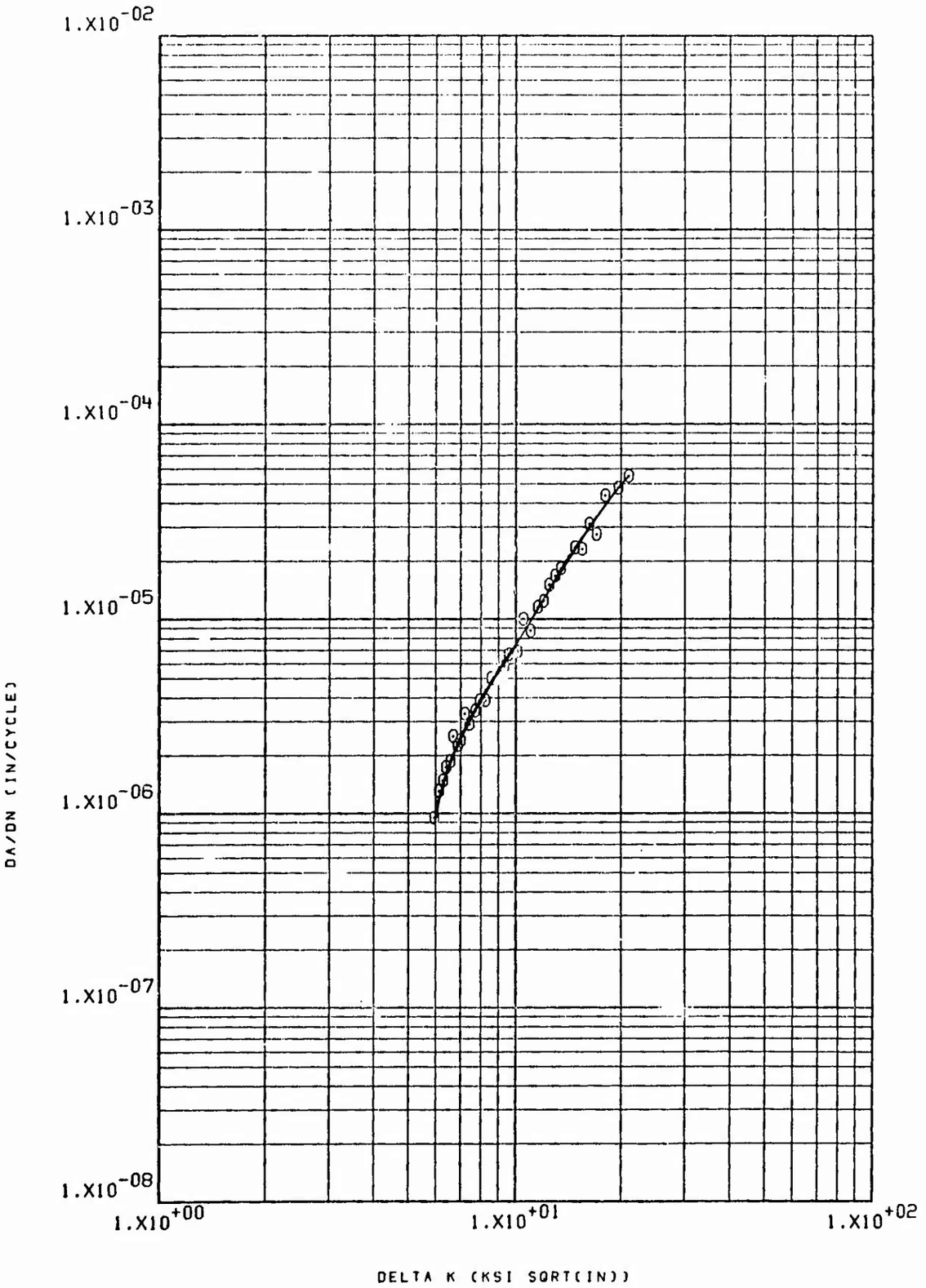

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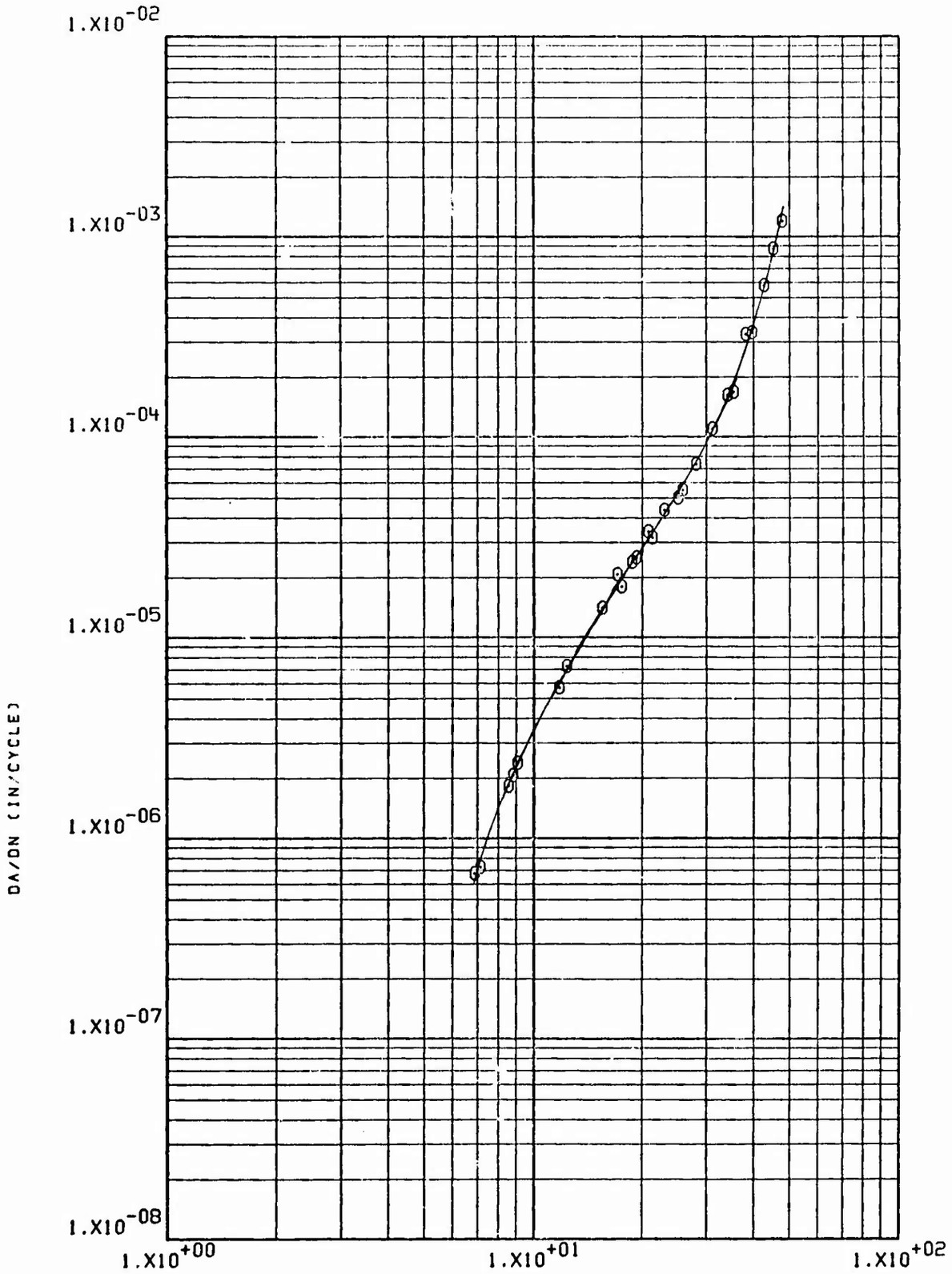

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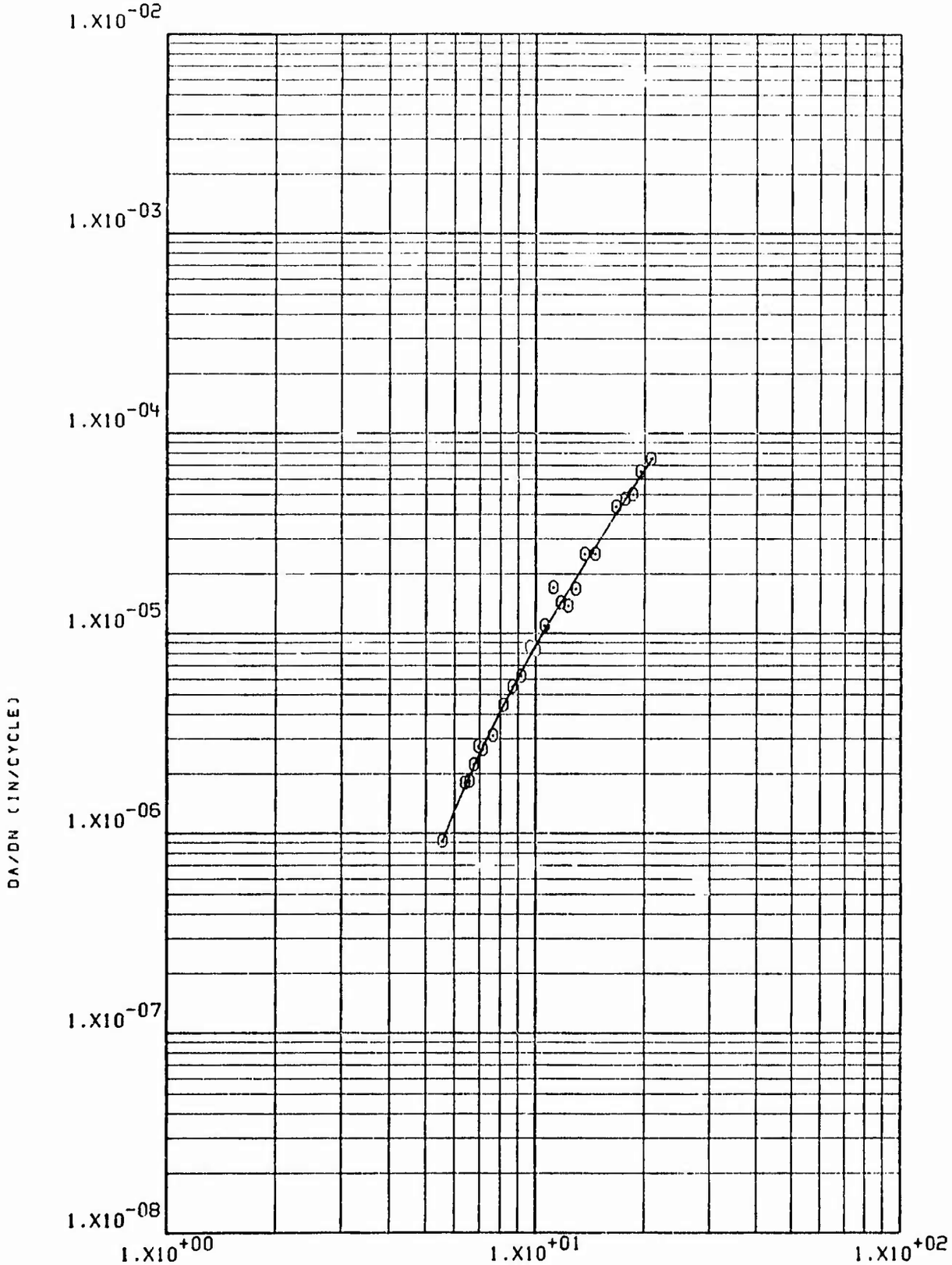

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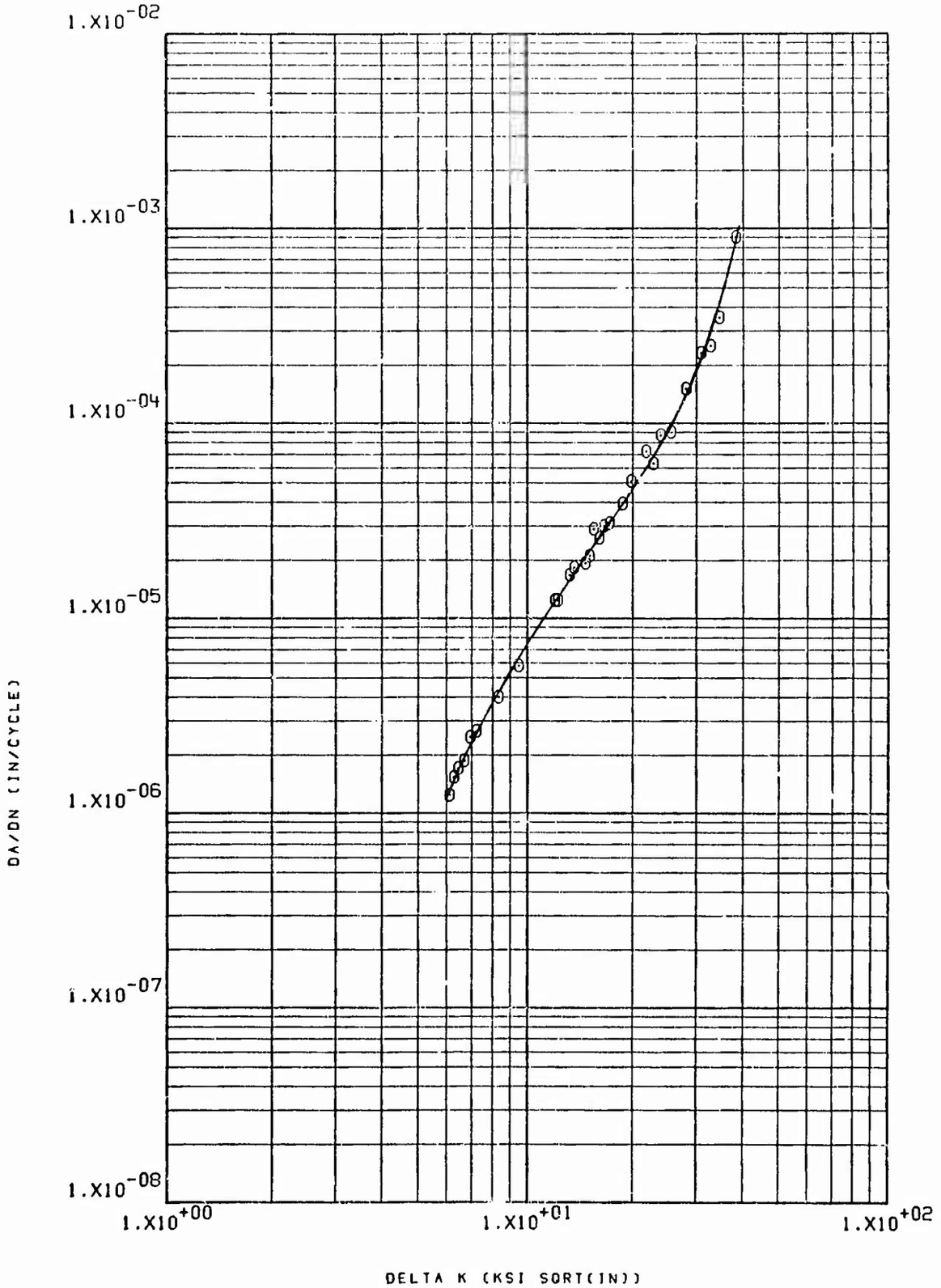

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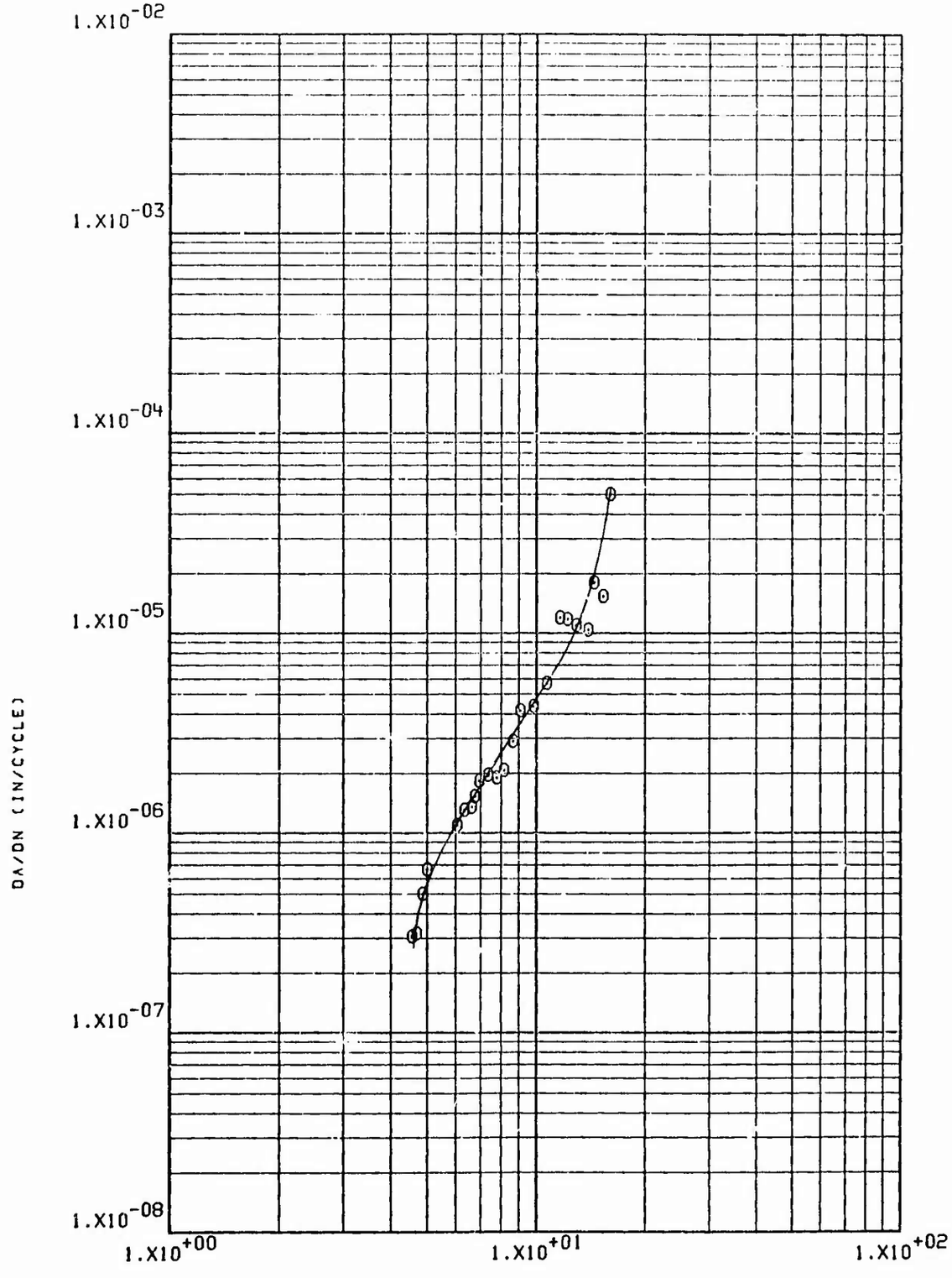
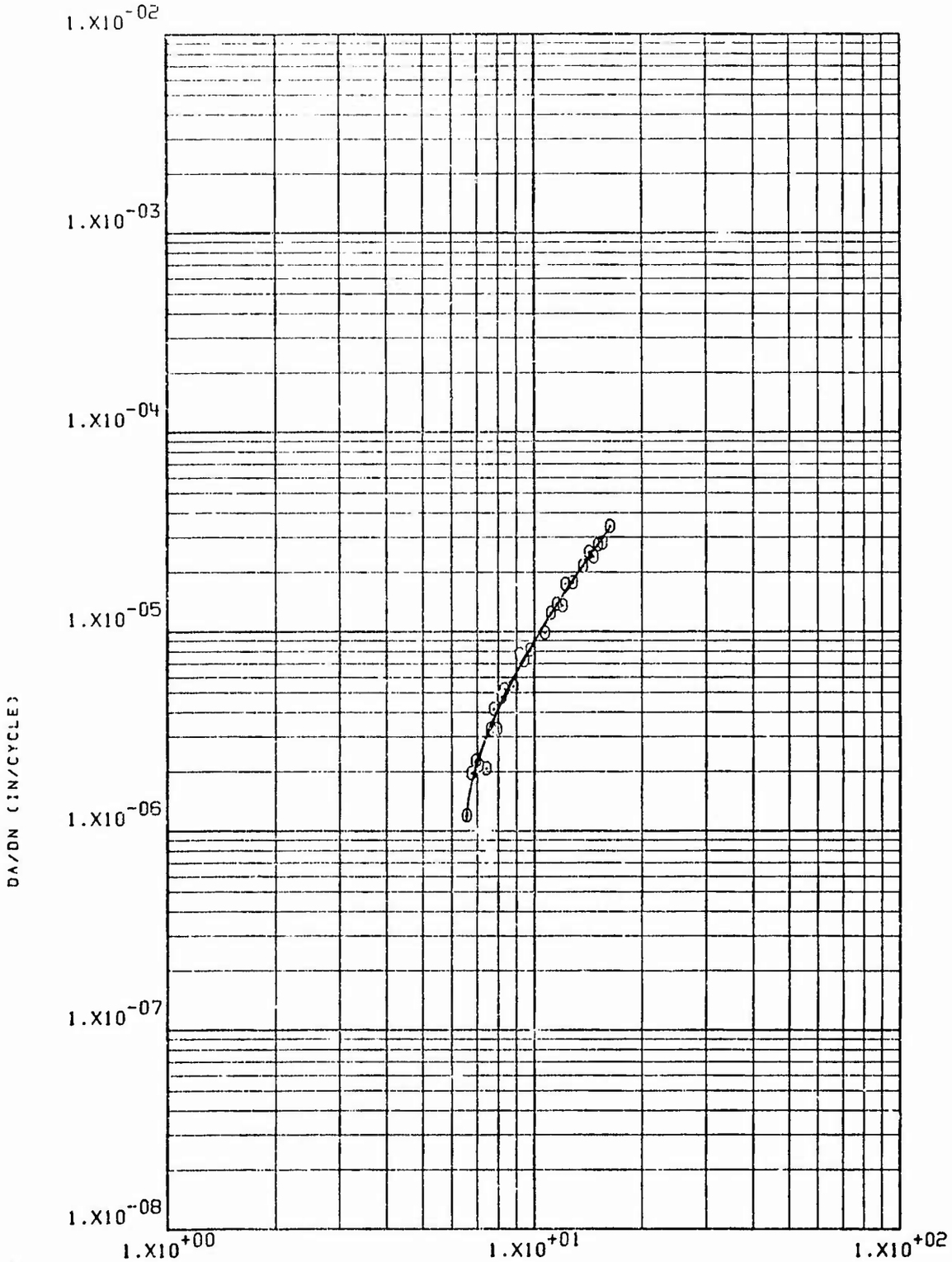


7 NRW 27-43 2219-T851 SUMP R.T. 60CPM R=.08



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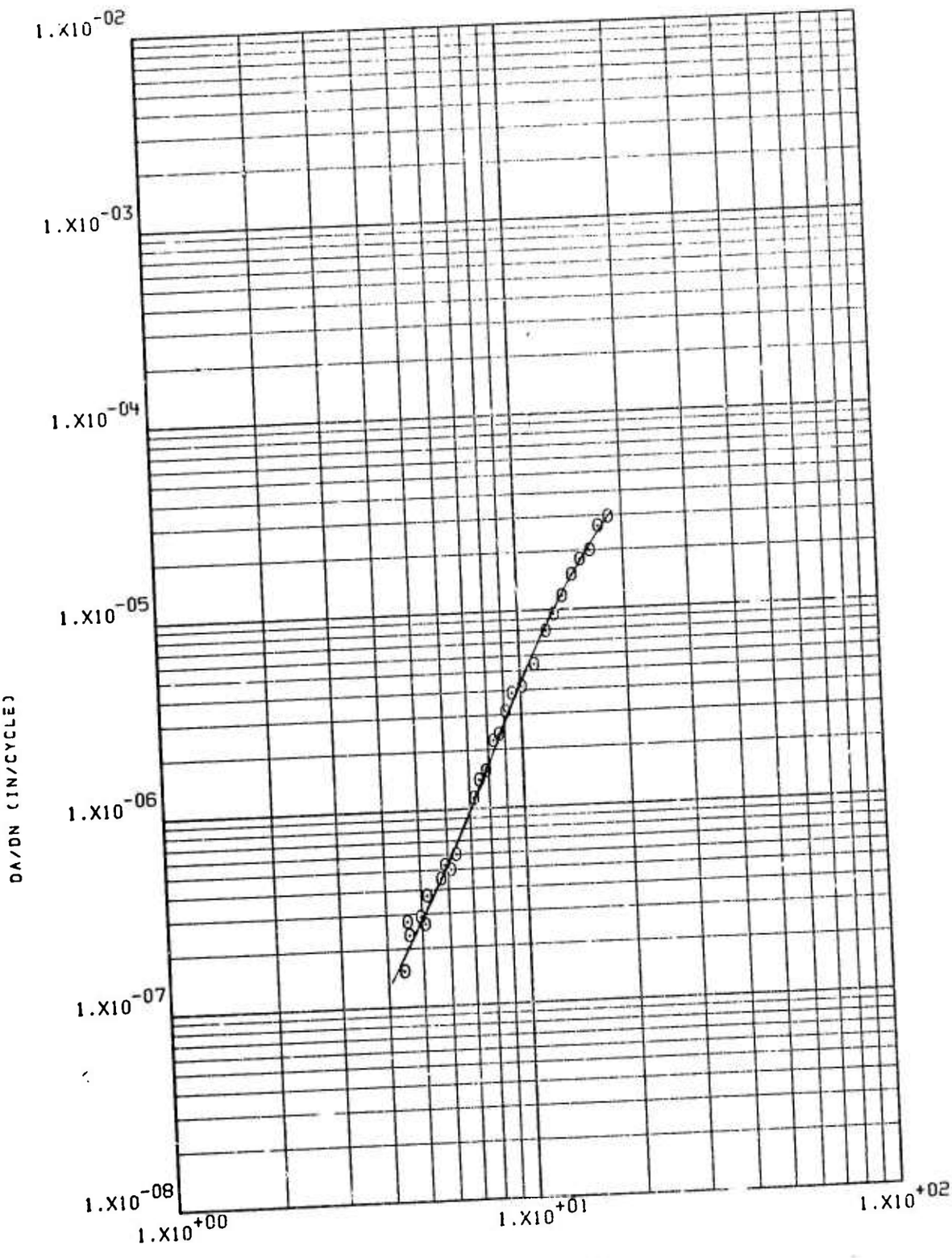

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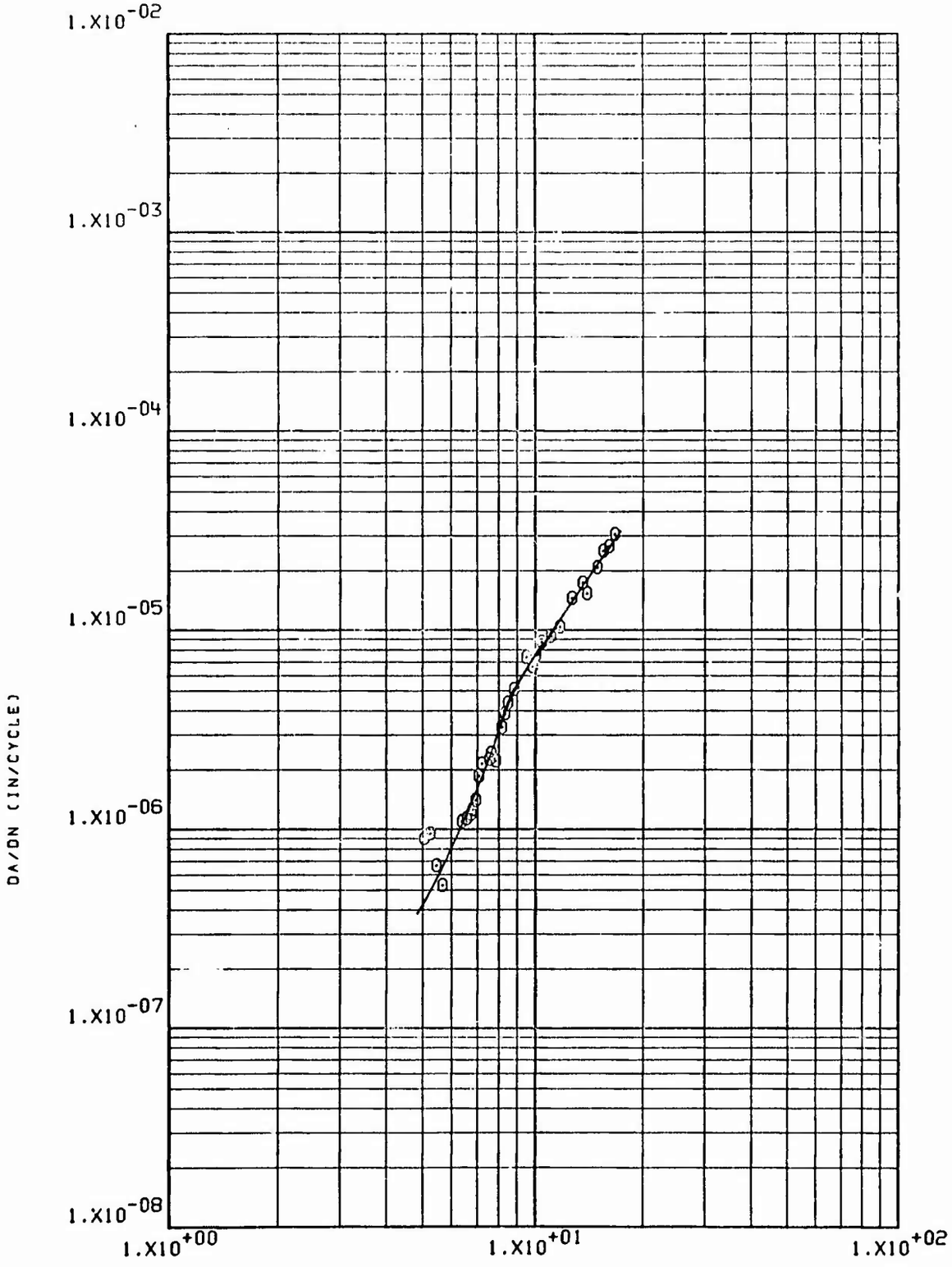

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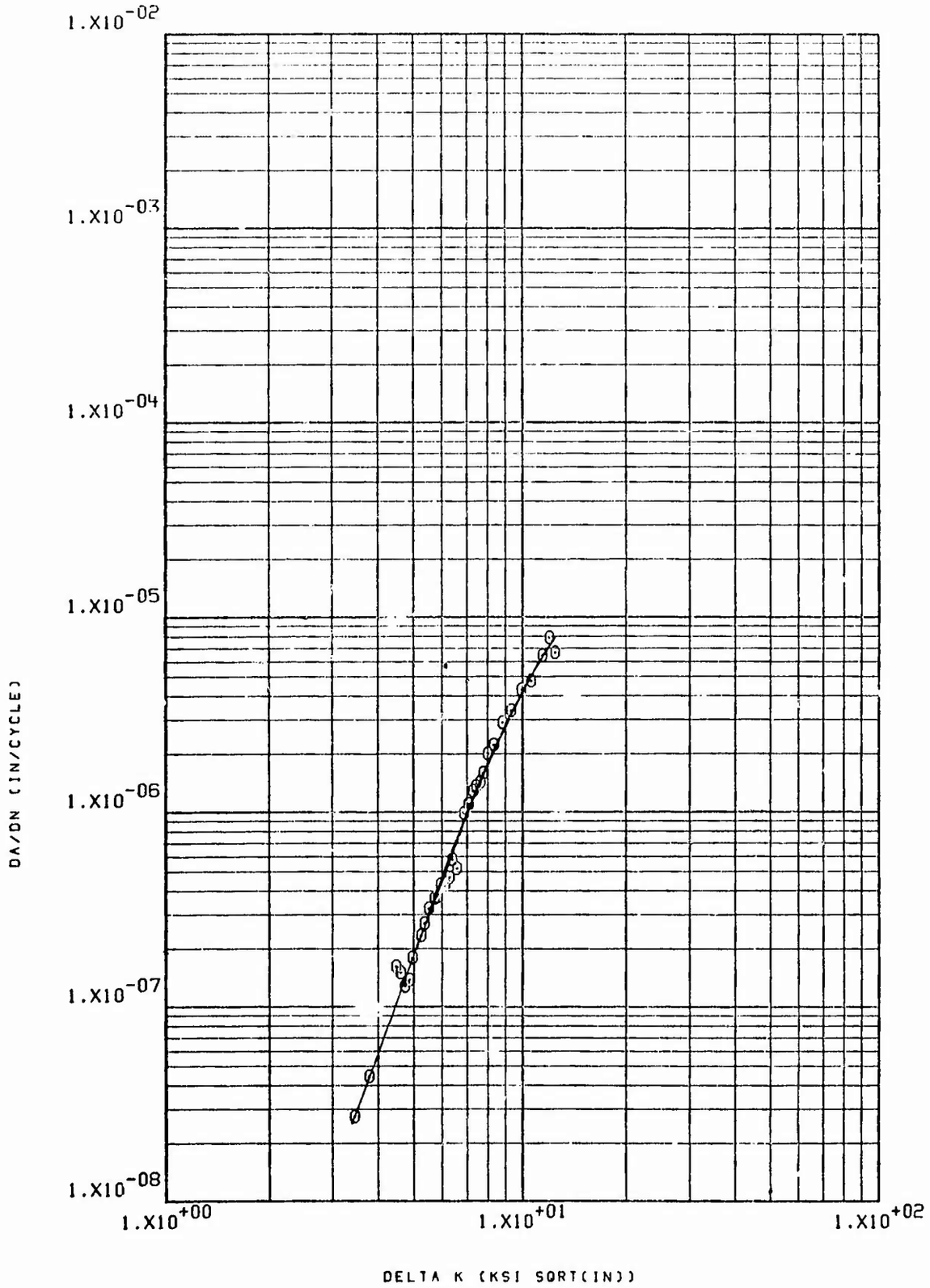

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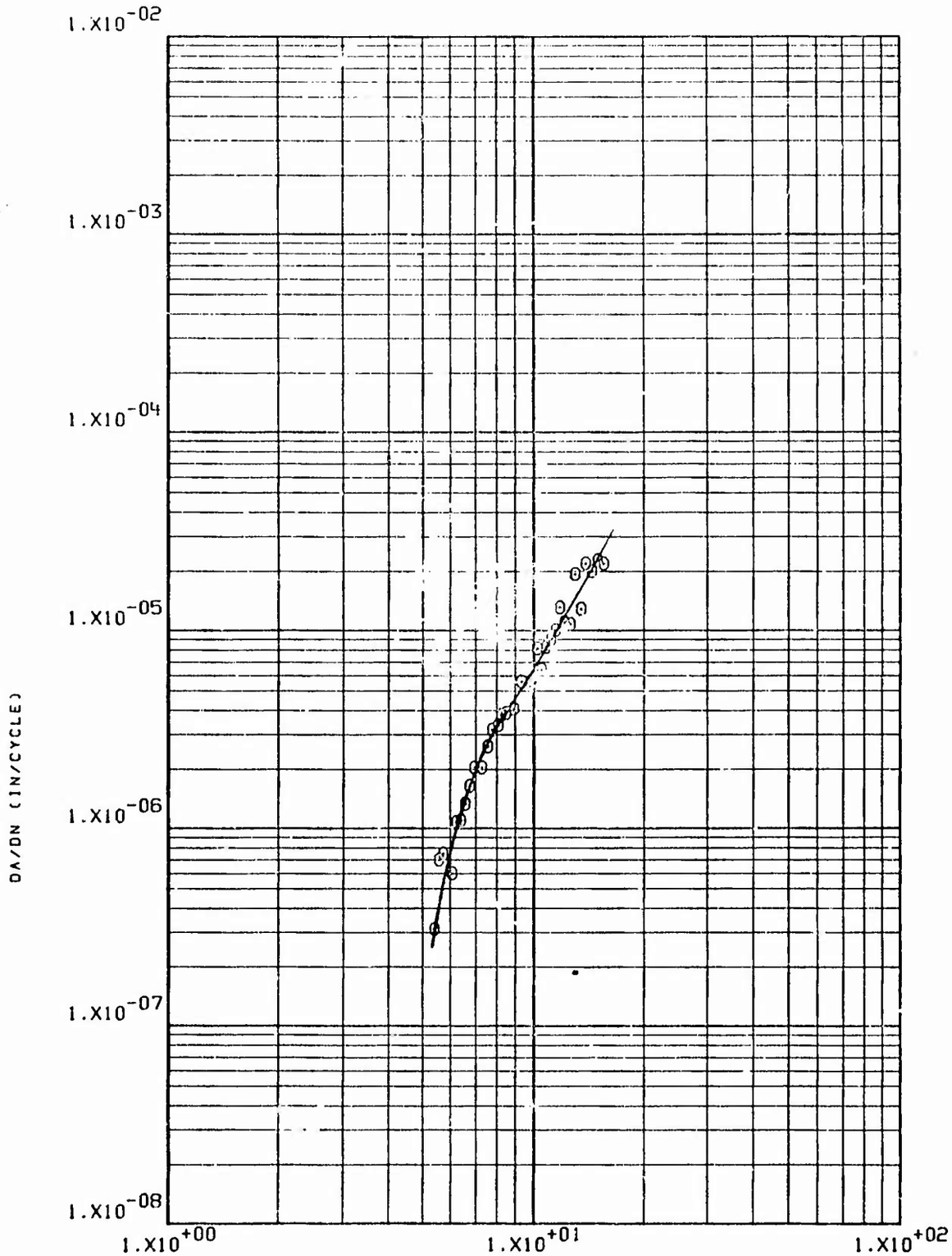
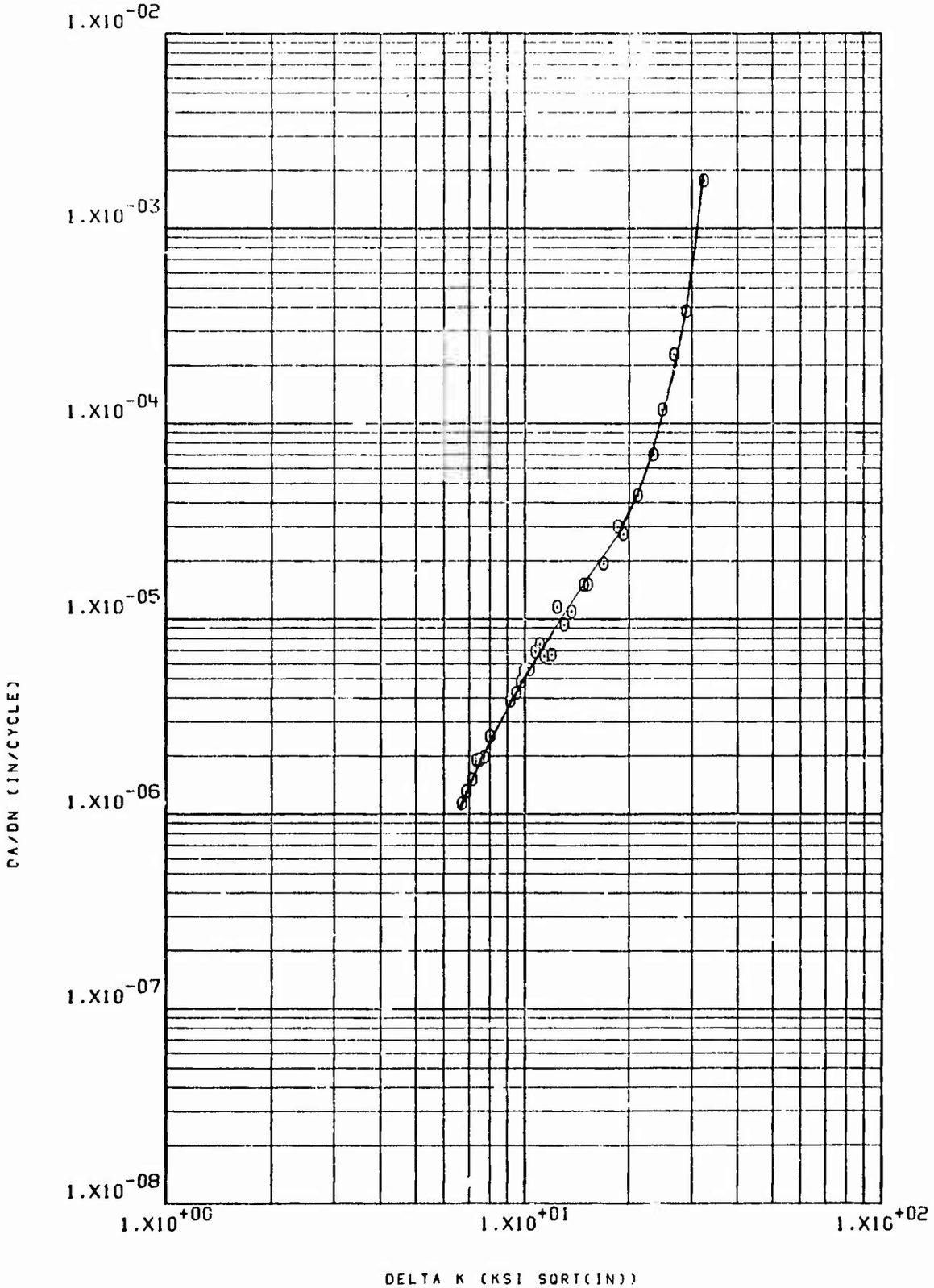
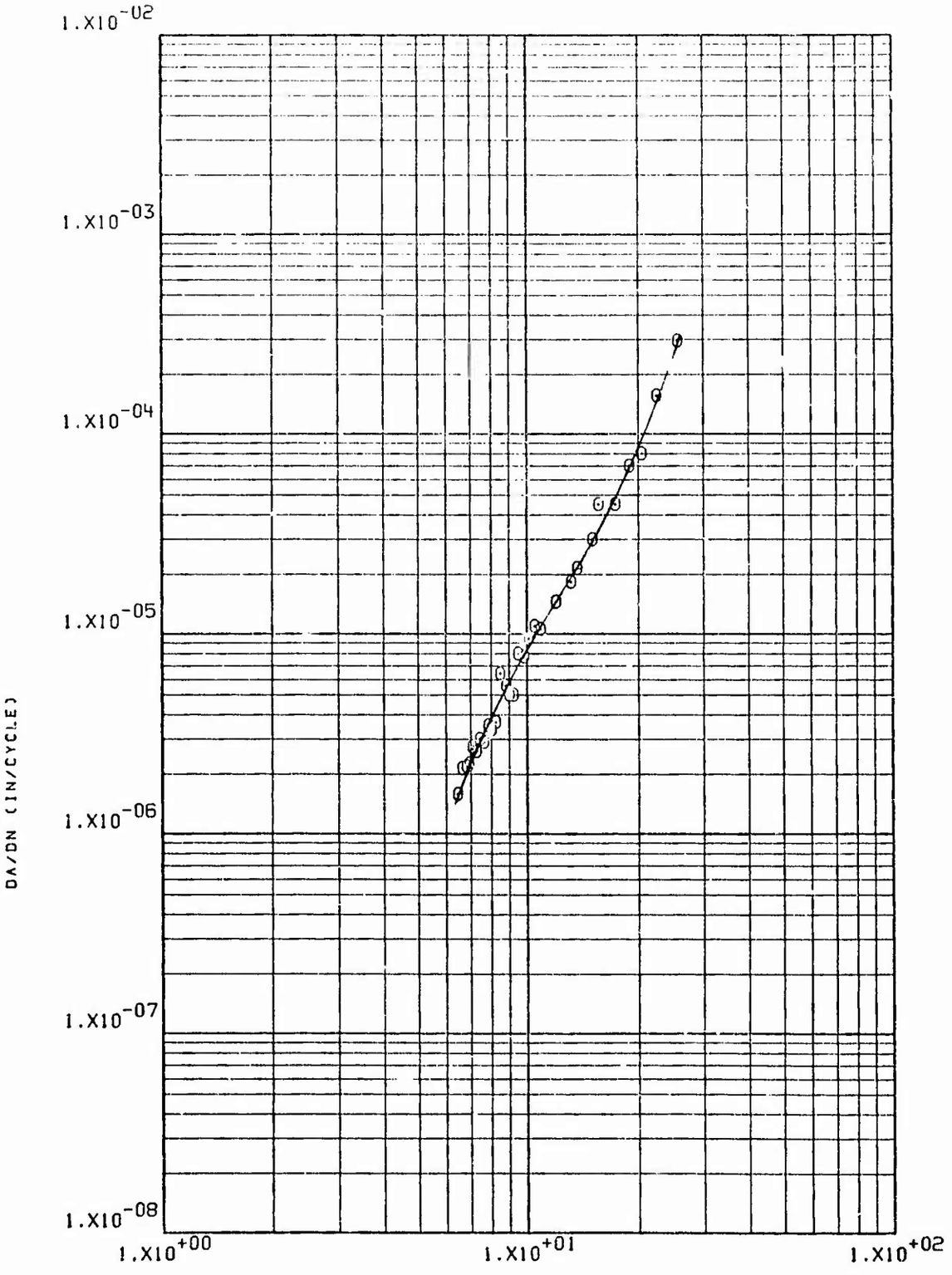


7 NRW 27-50 2219-T851 SUMP R.T. 60CPM R=.08



7 NWR 36-10 2219-T851 LHA RT R=.08 360 CPM



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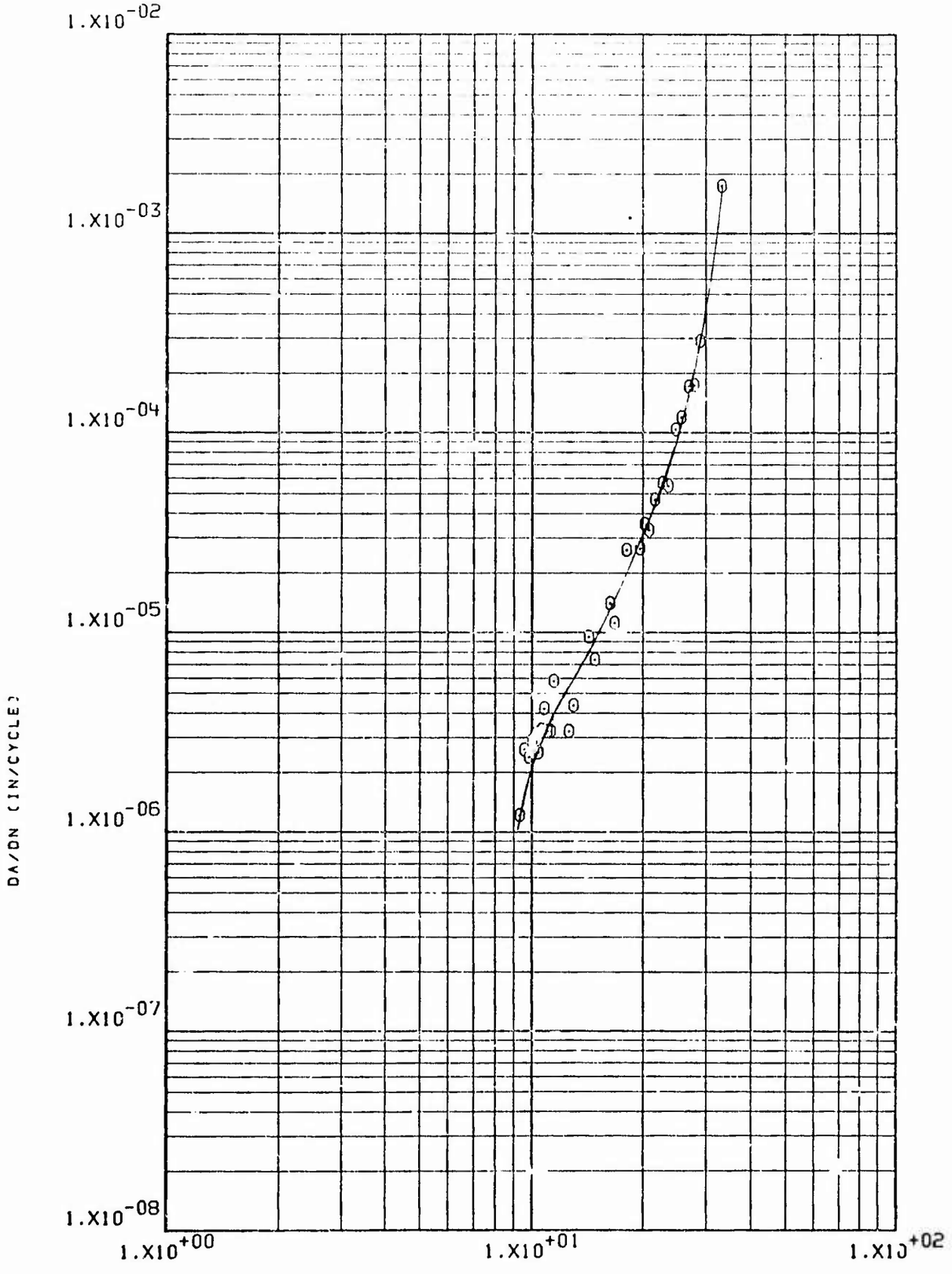

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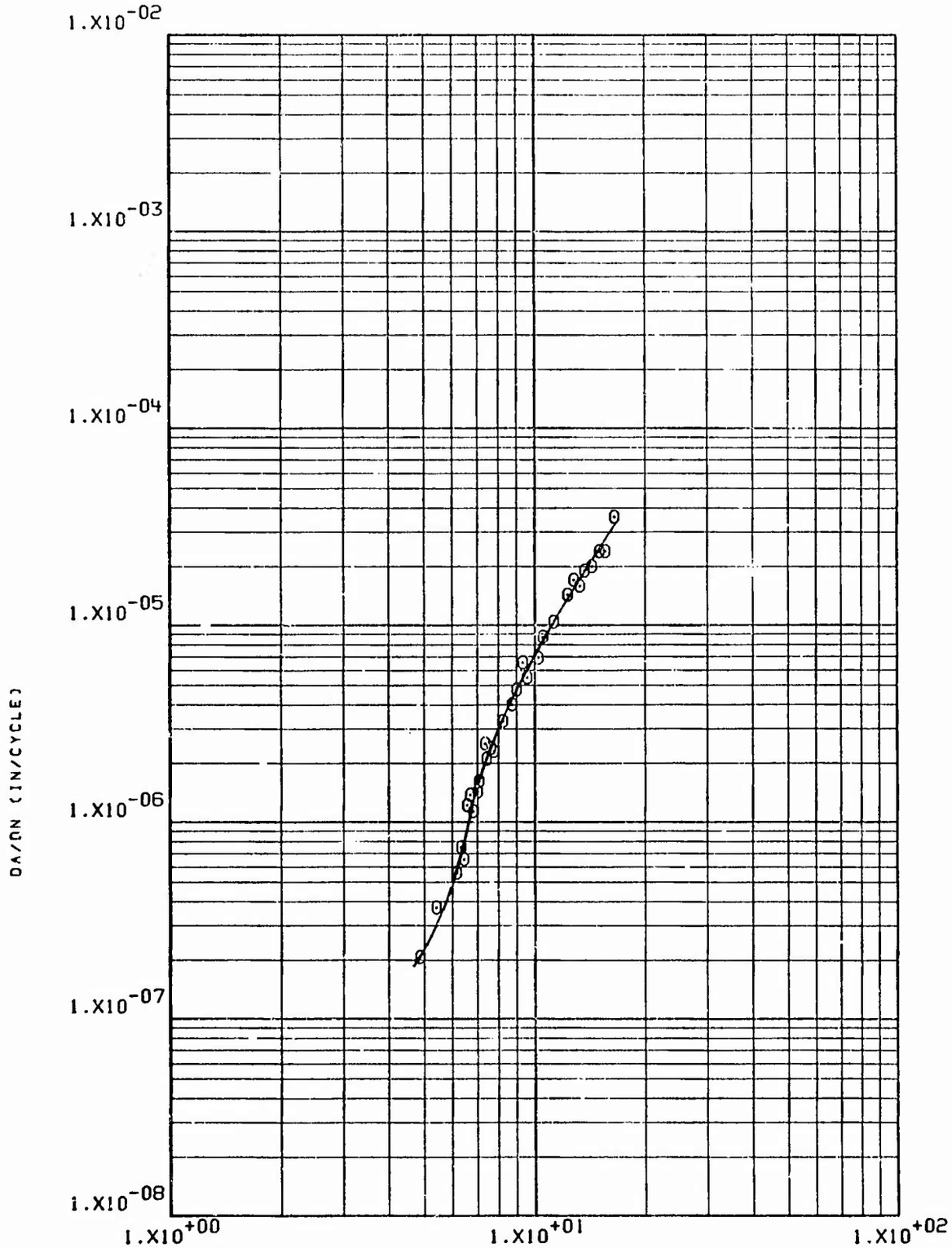

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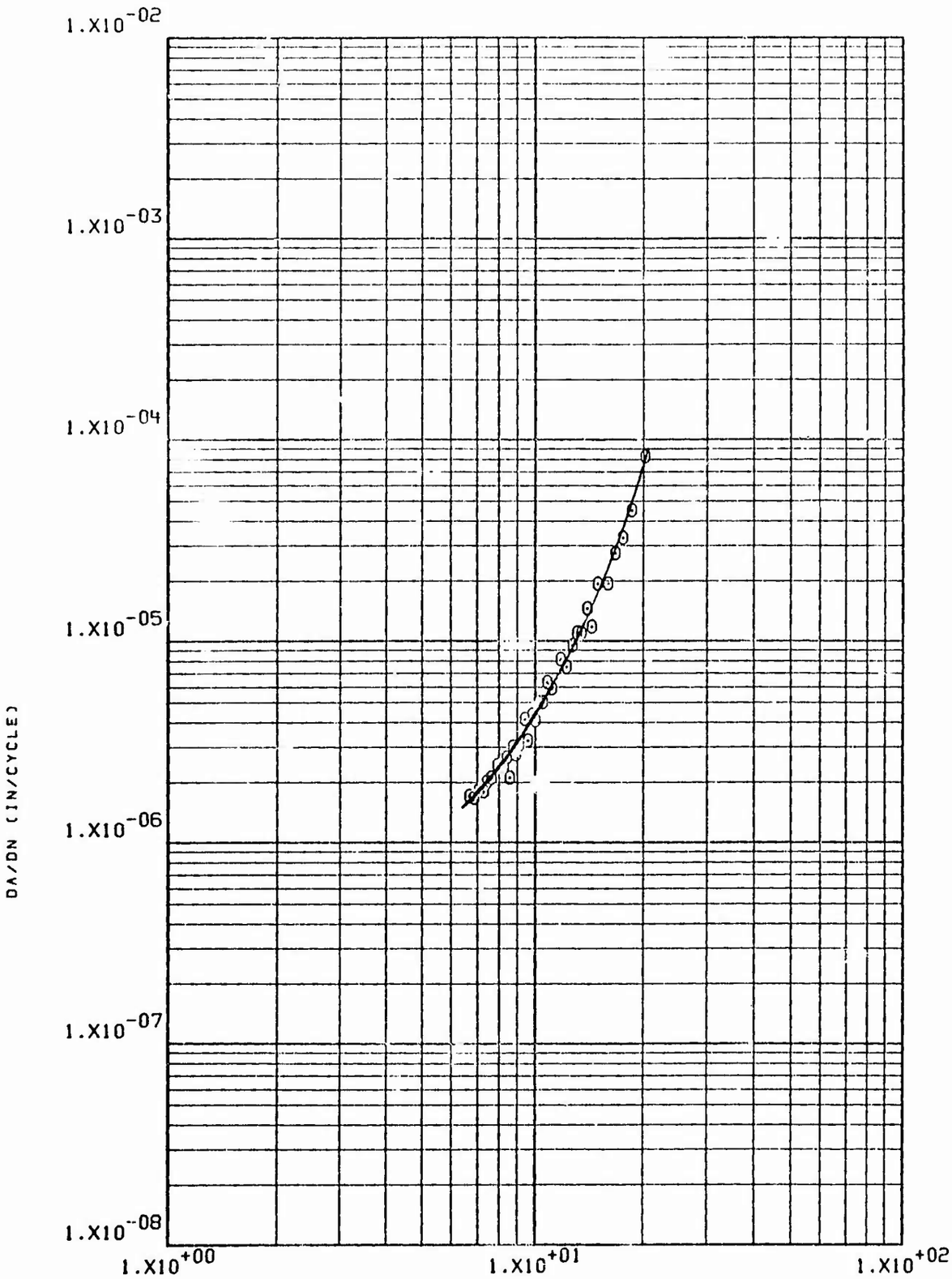

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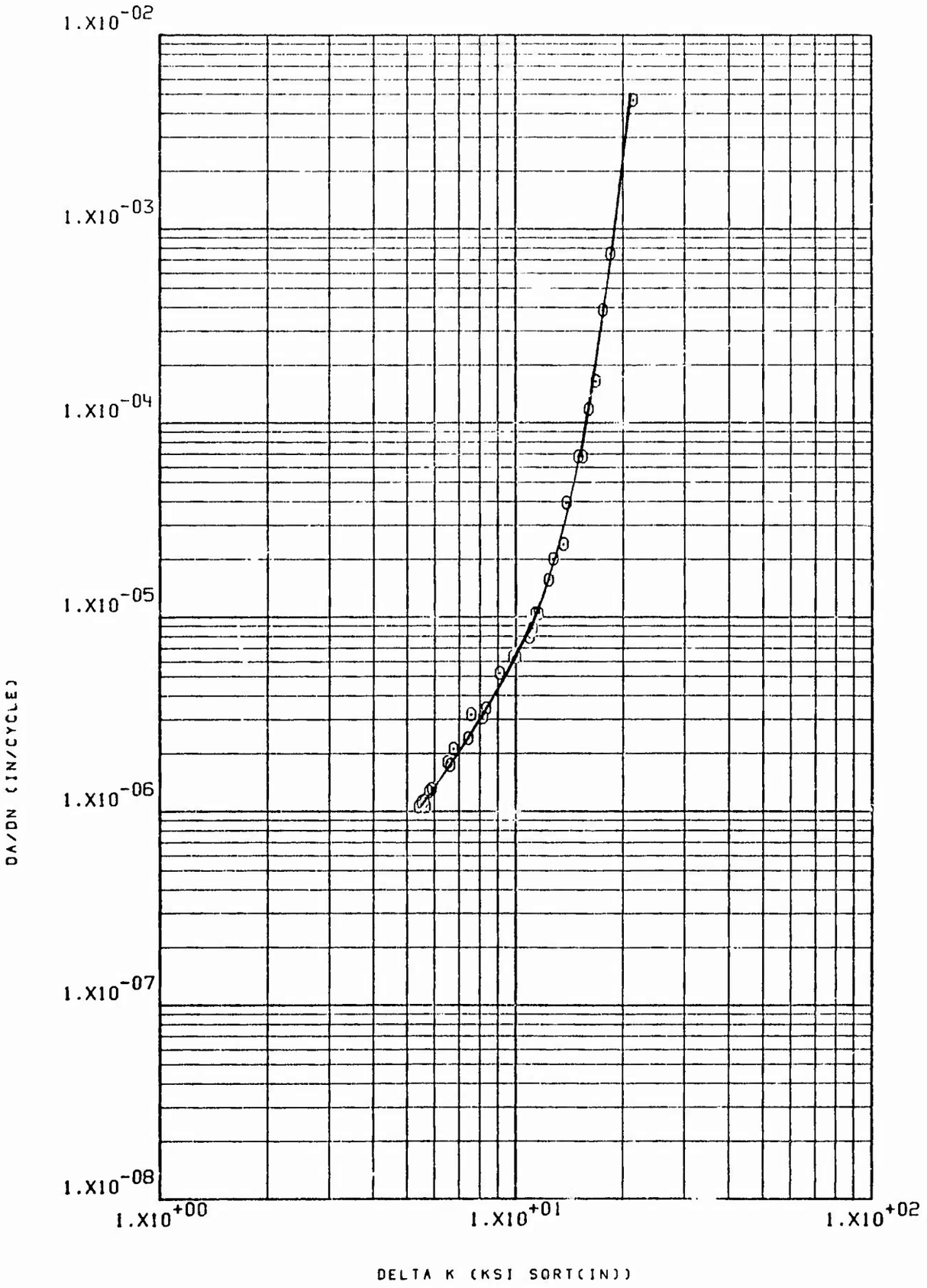

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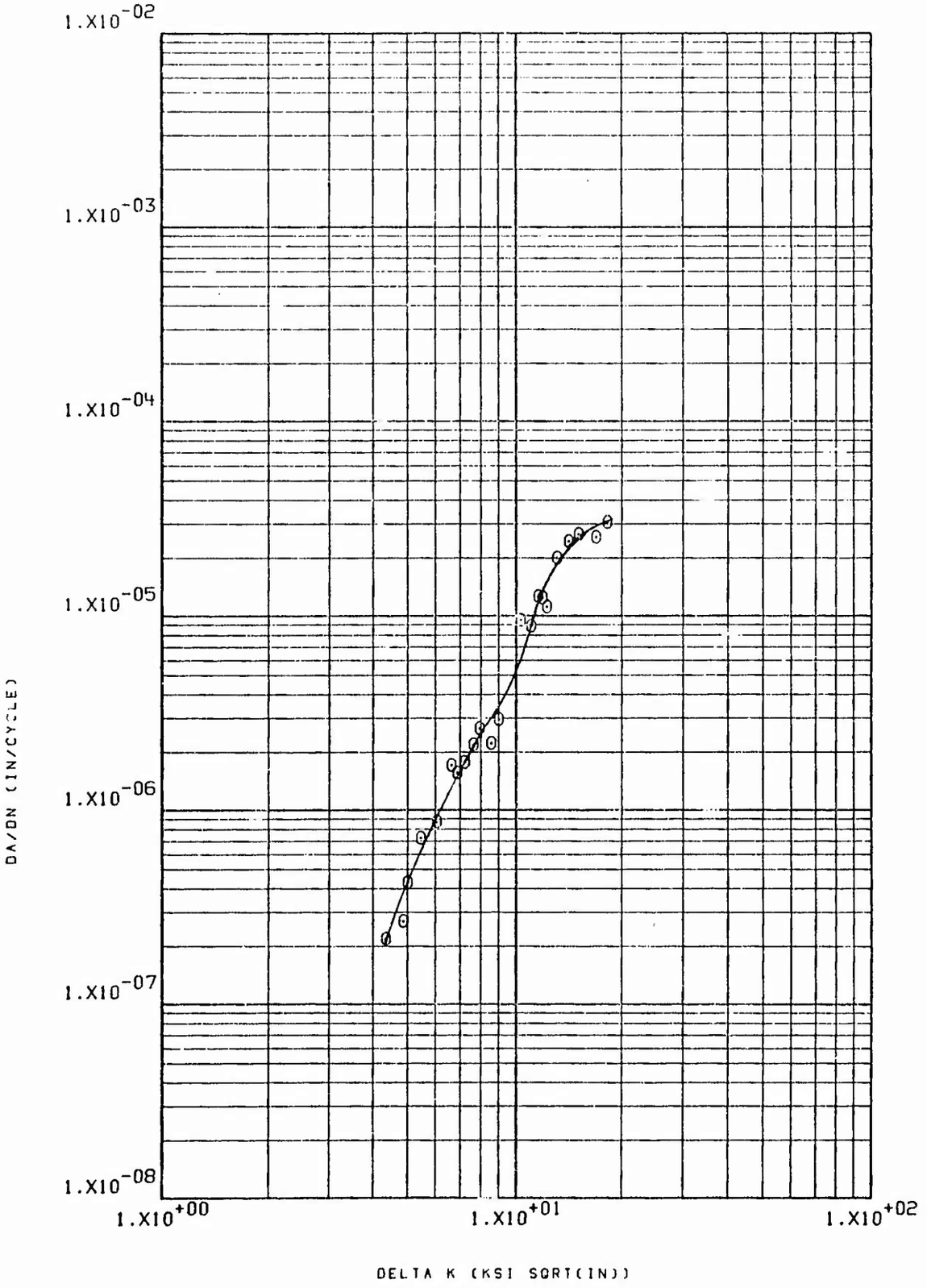

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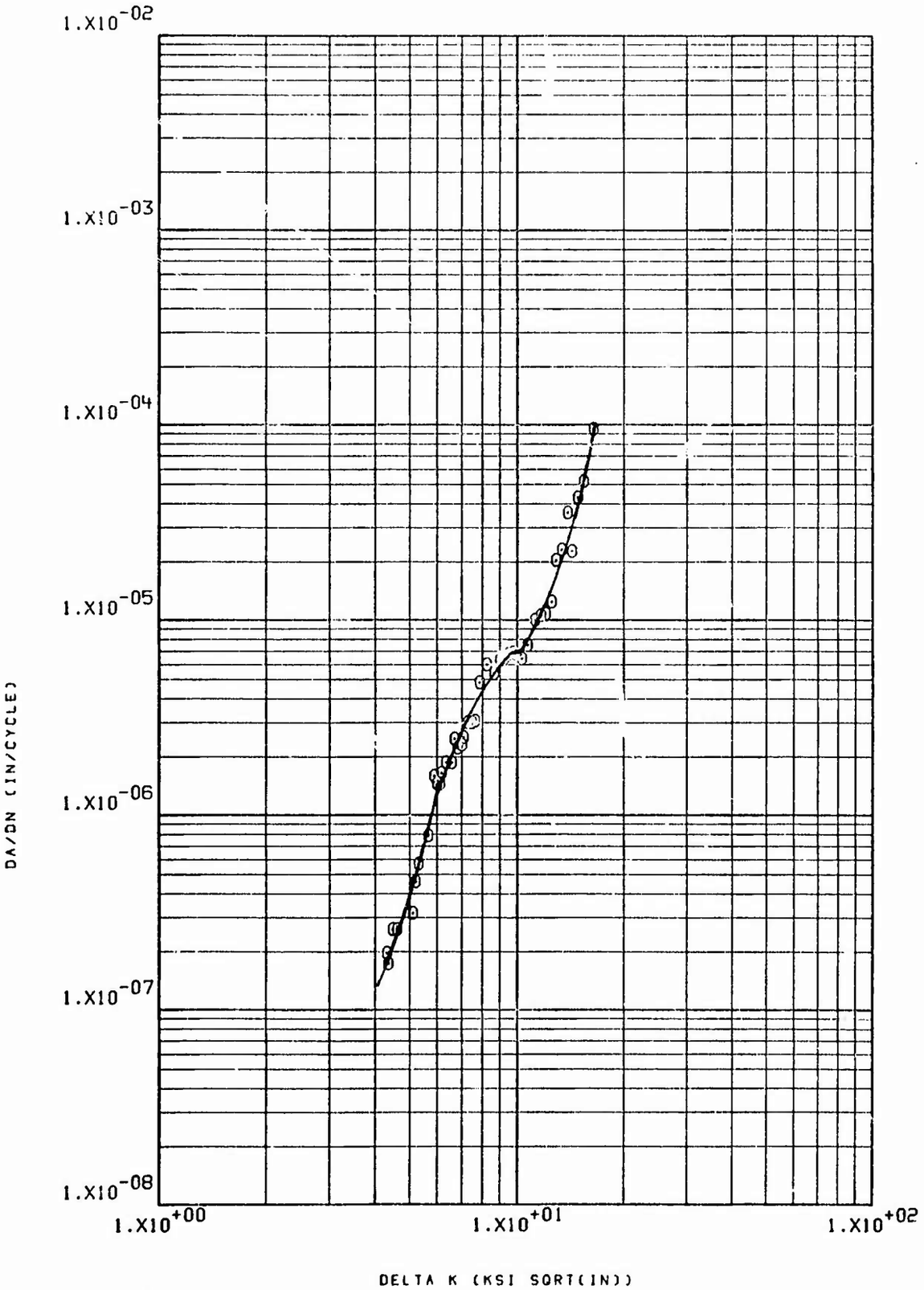

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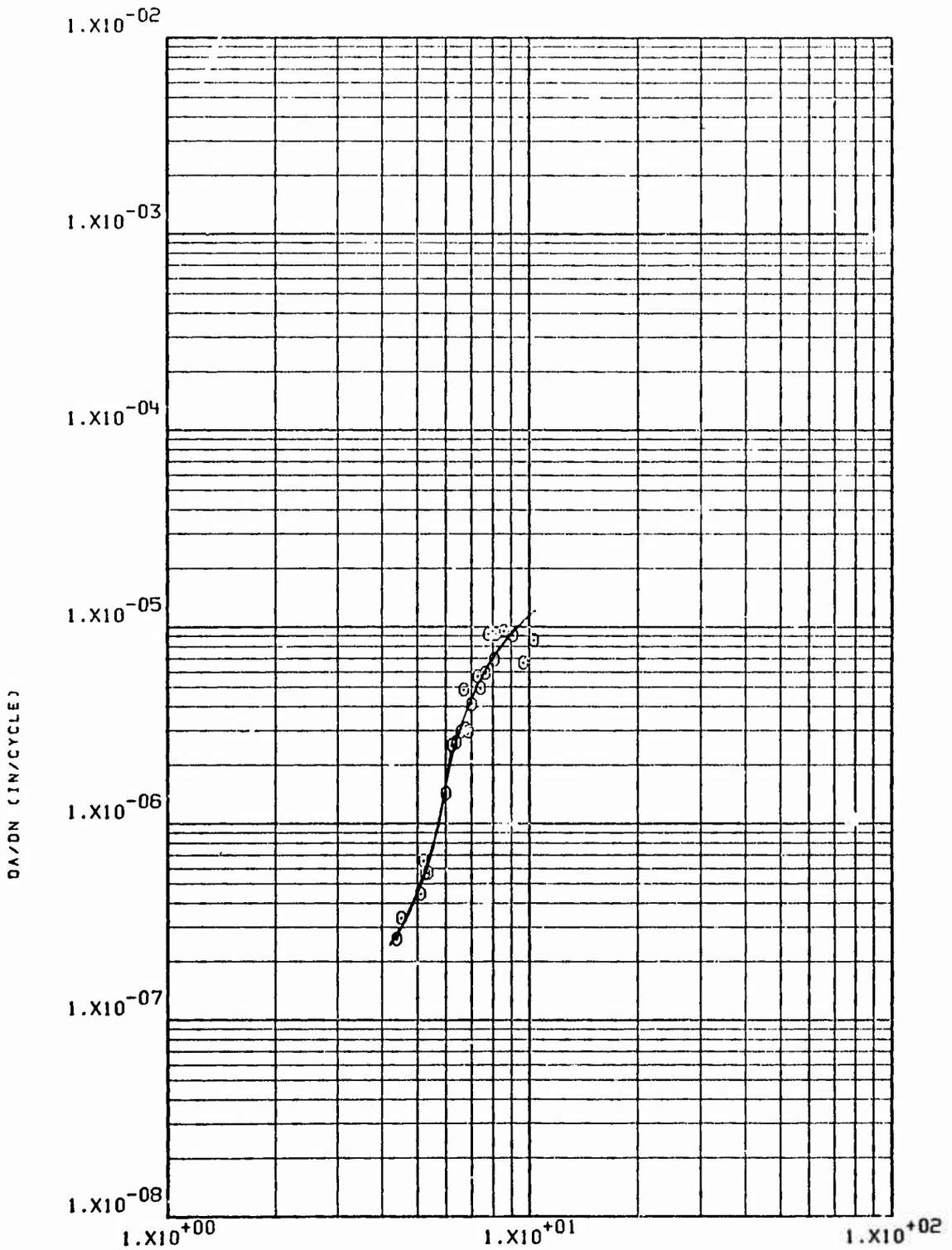

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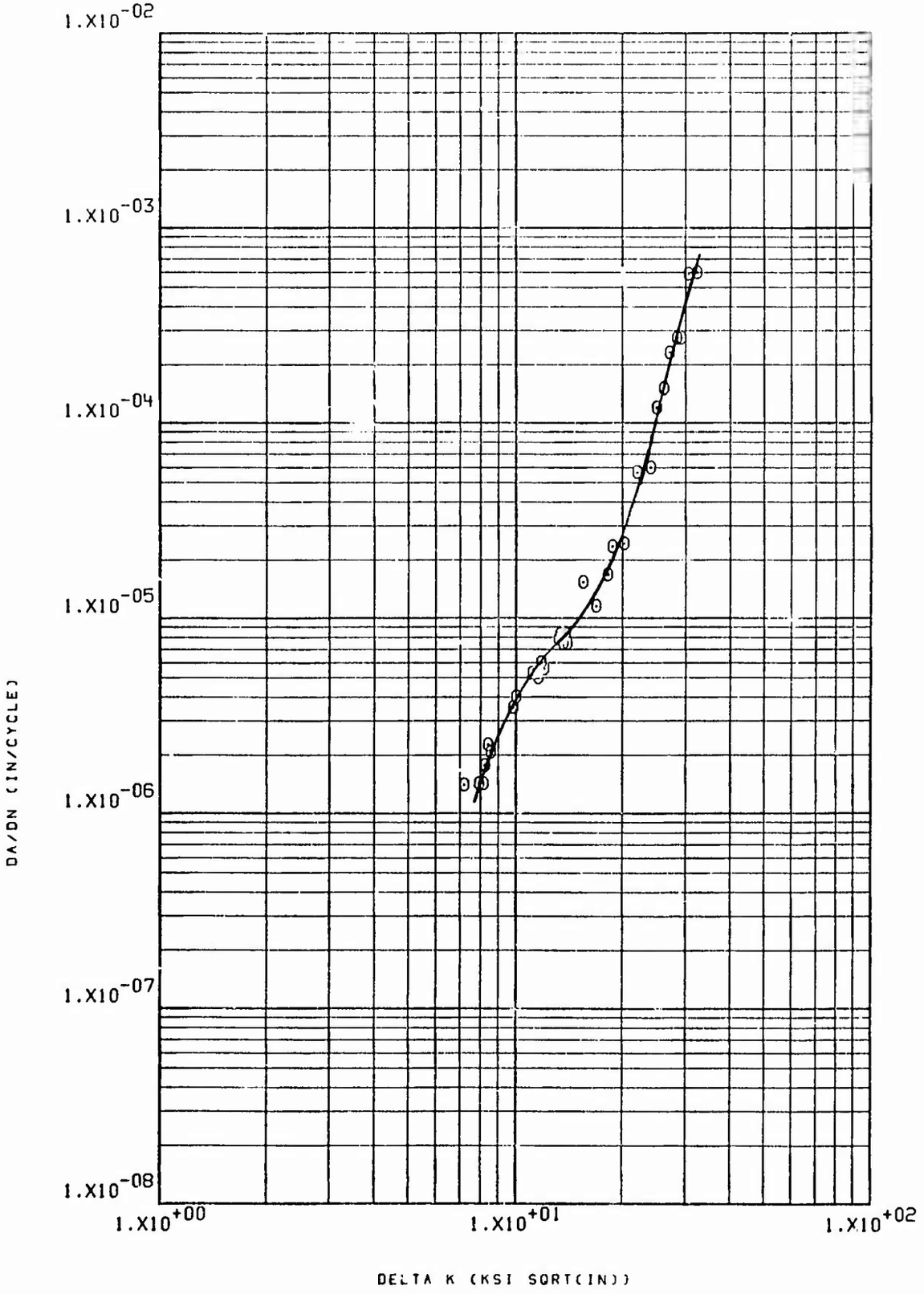
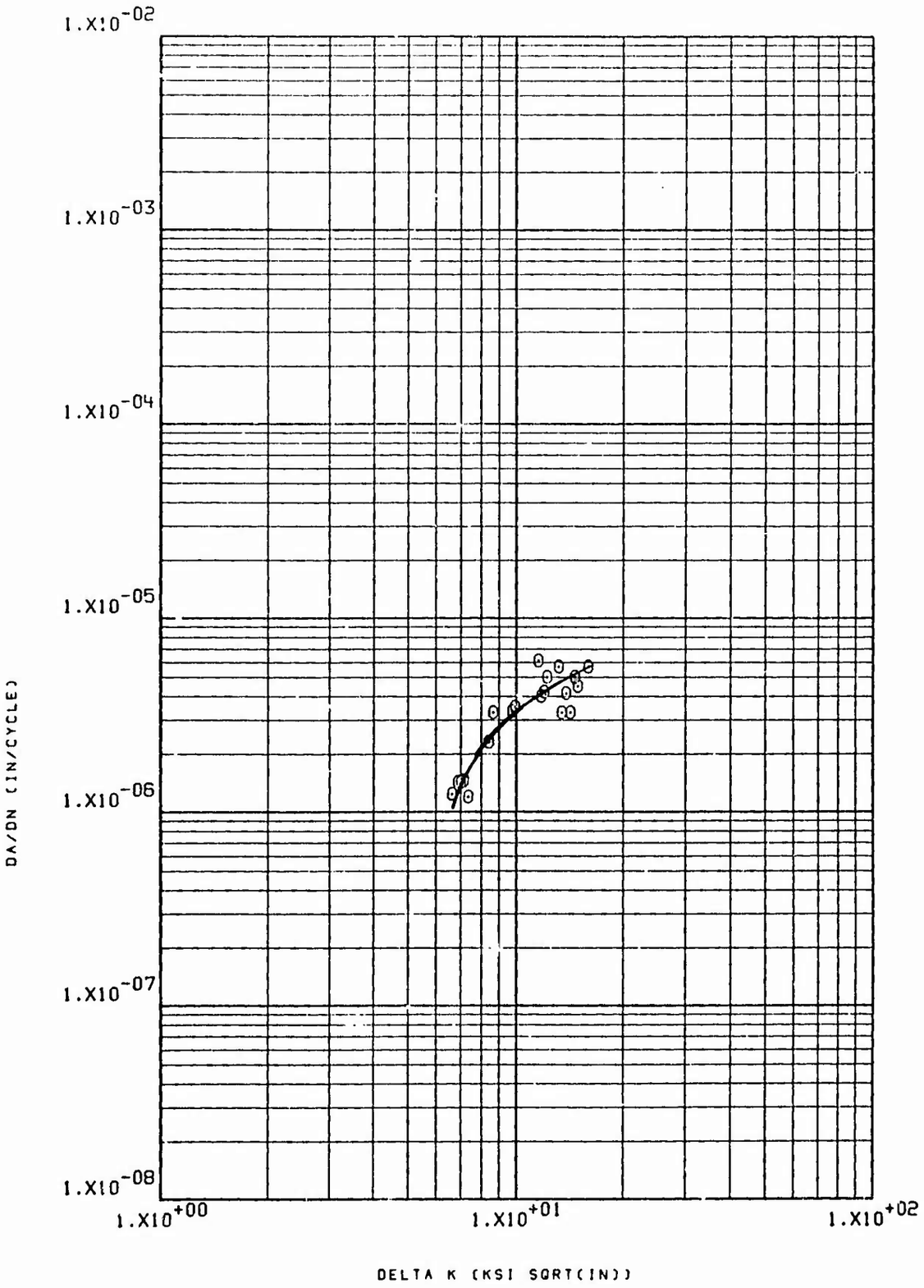


13 NRW 37-12 2219-T851 ALUMINUM LHA RT R=.08 360CPM



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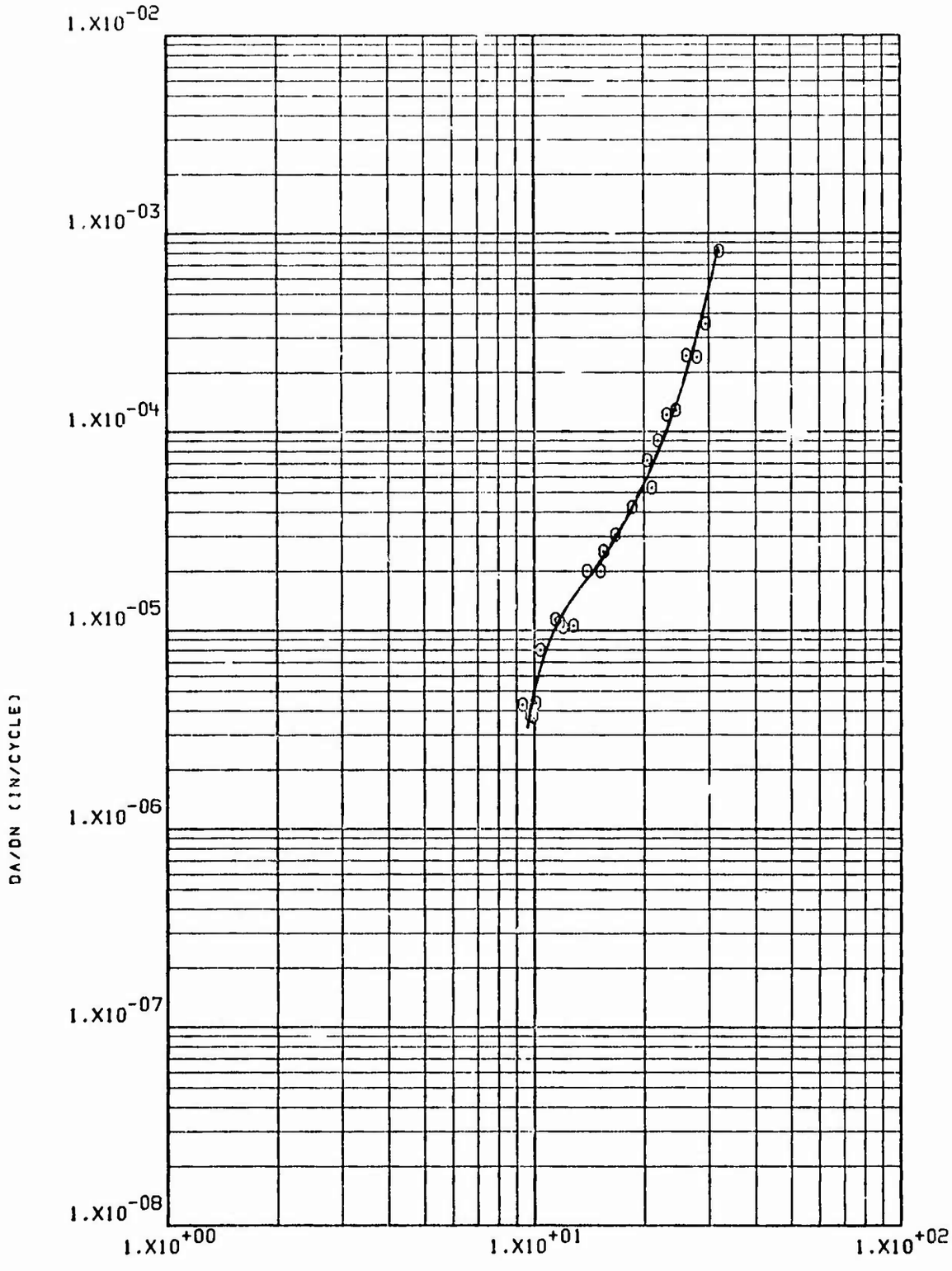

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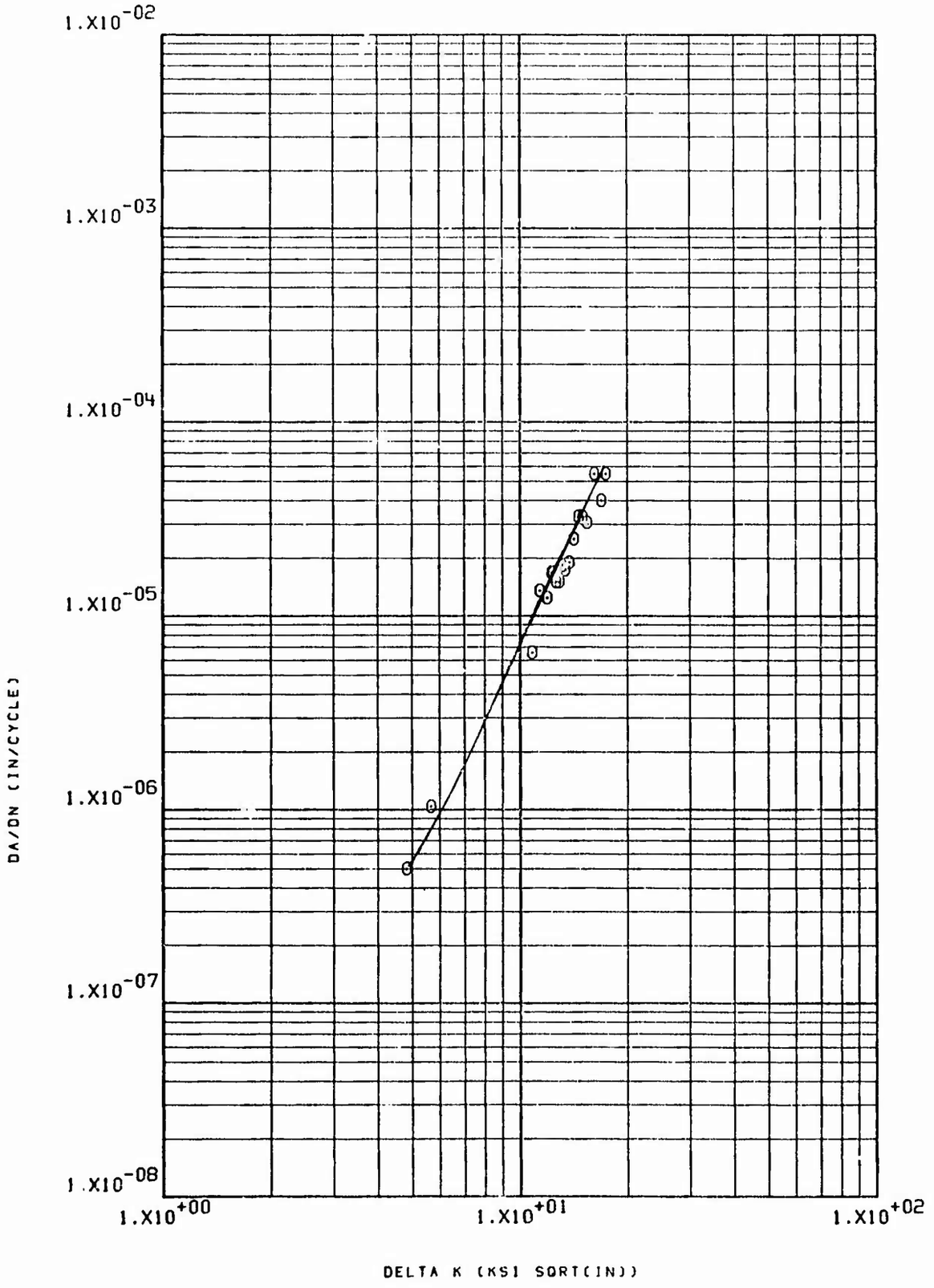
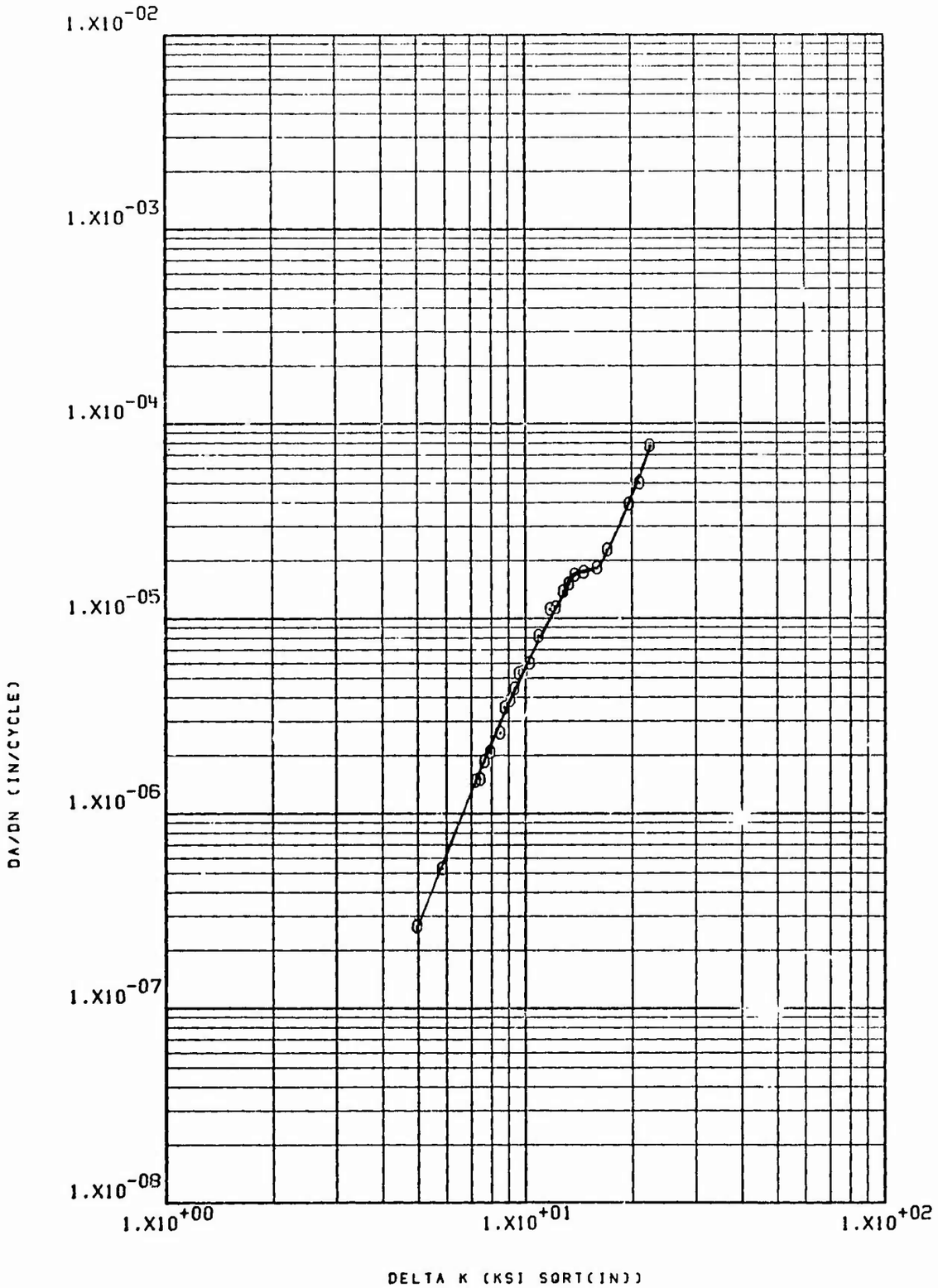
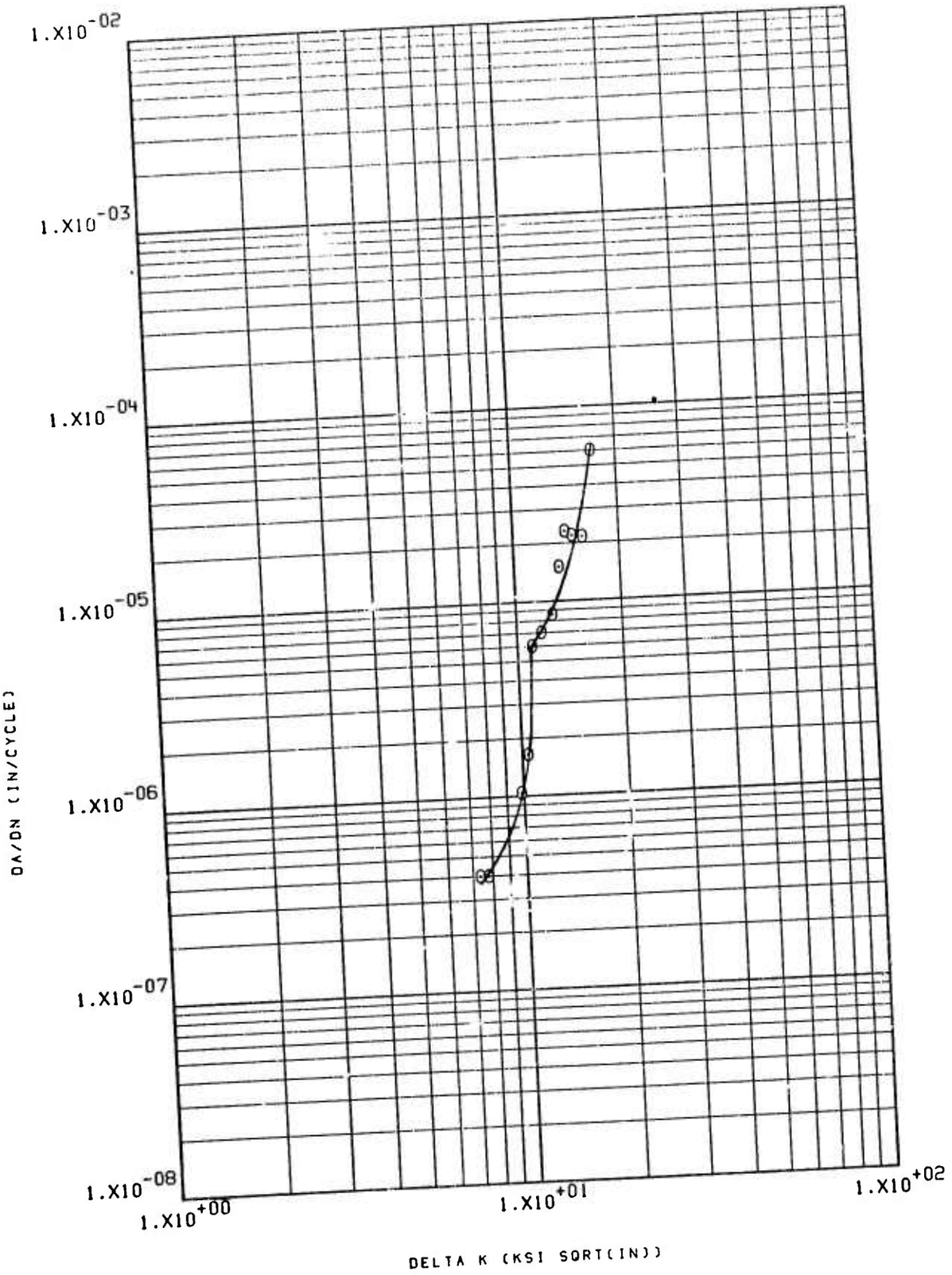


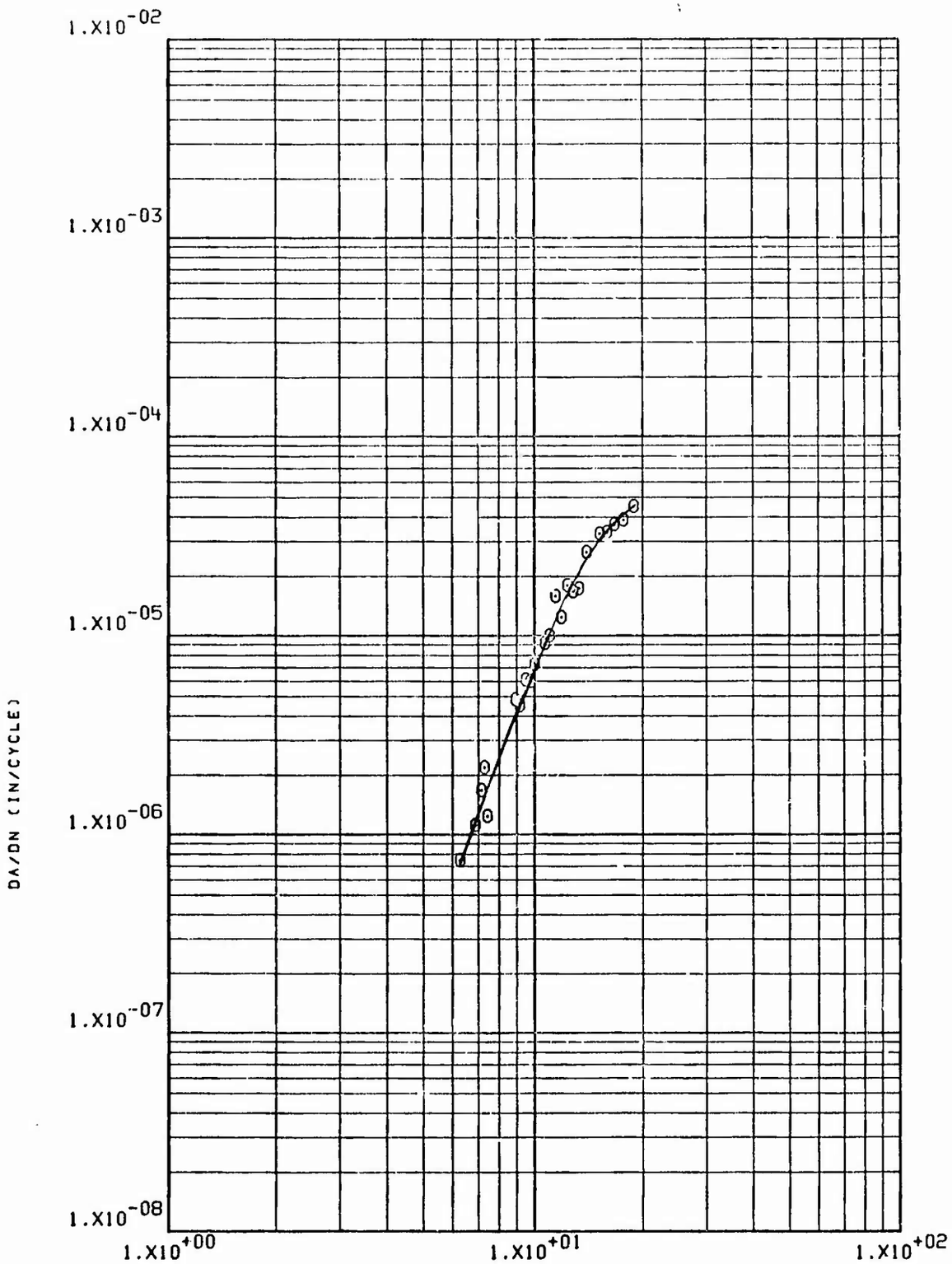
13 NWR 37-15 2219-T851 SUMP RT R=.08 60CPM



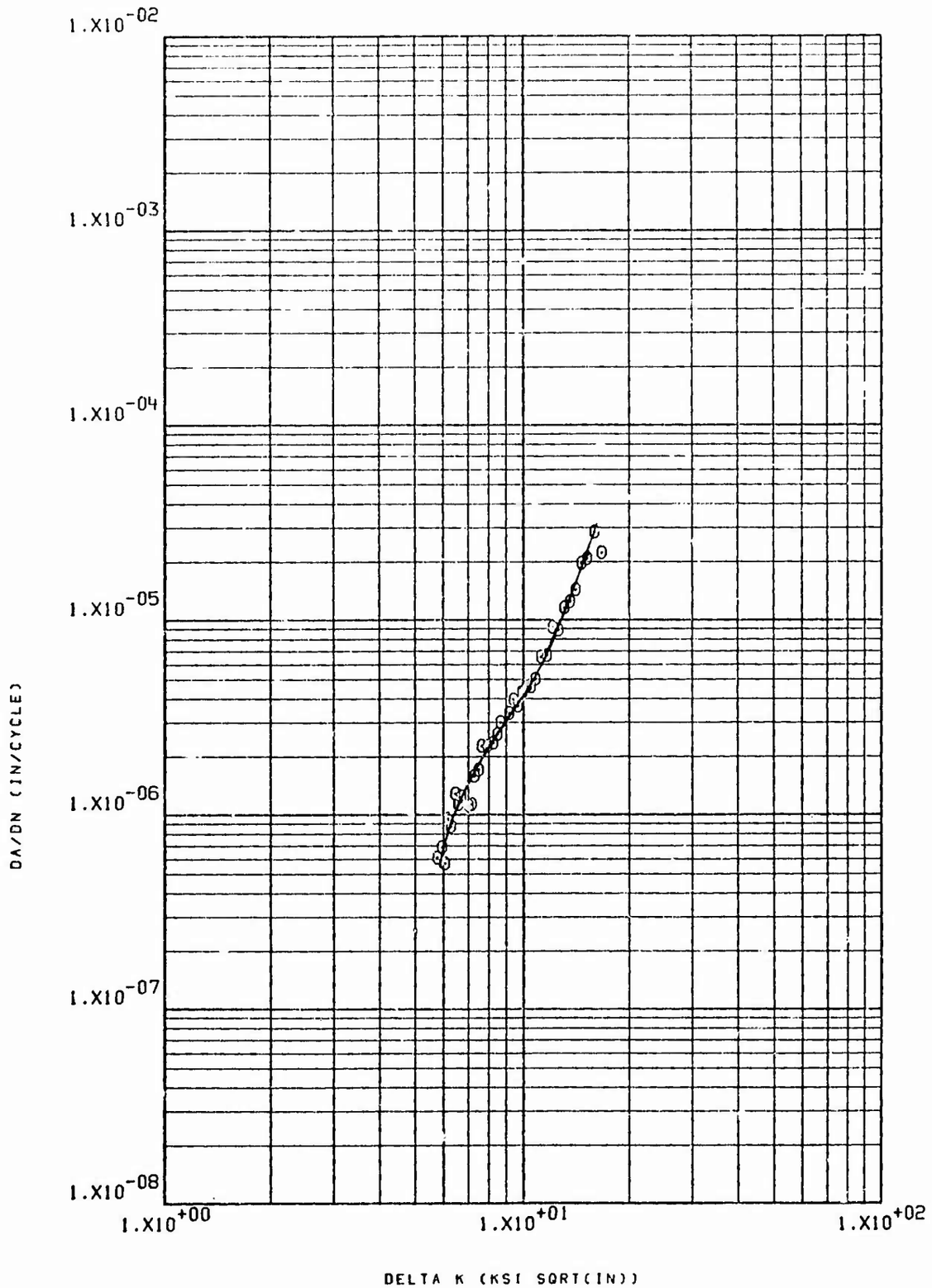
14 NRW 41-12 2124-T851 LHA RT R=.08 360CPM



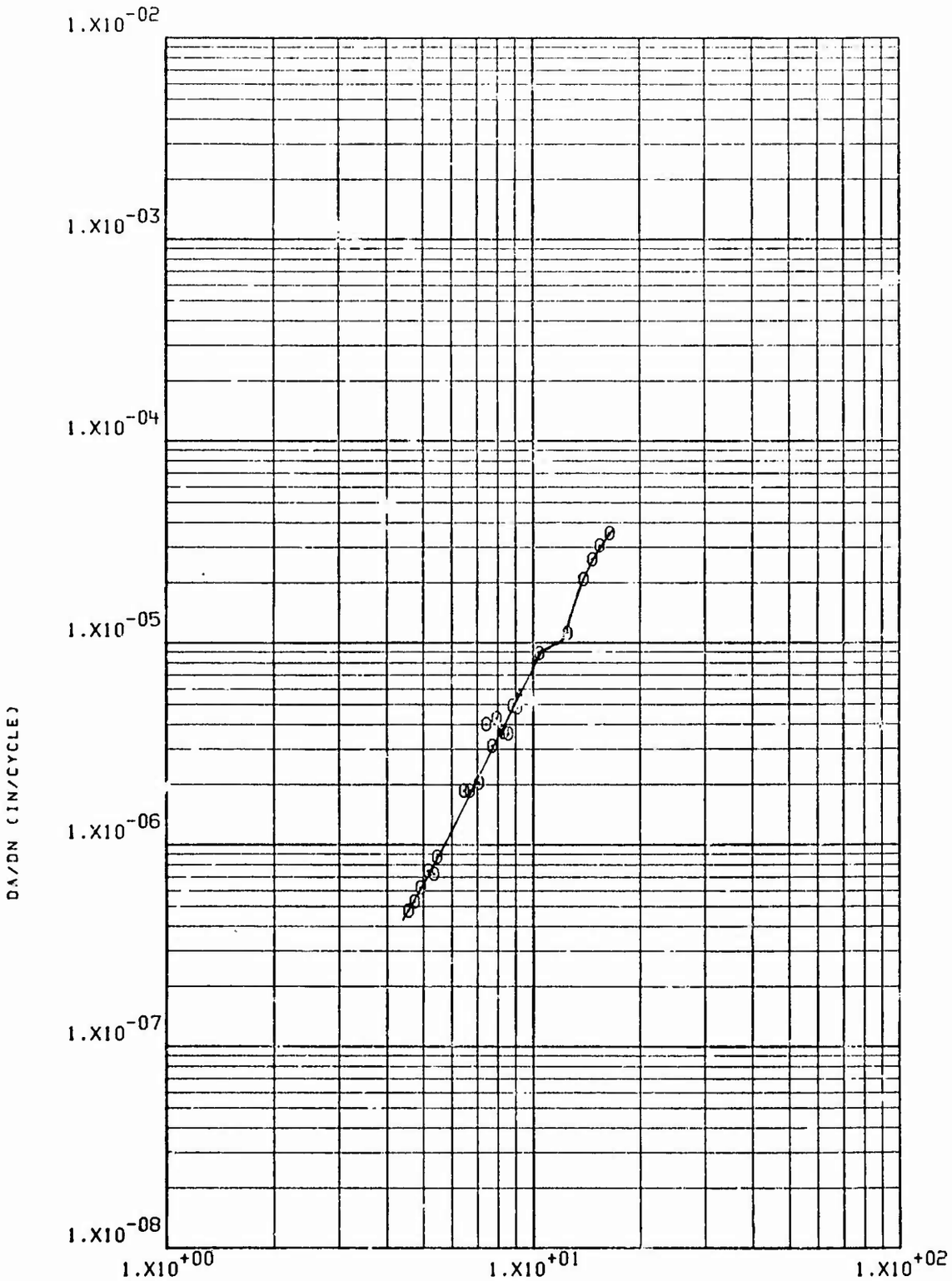
14 NRW 41-13 2124-T851 SUMP WATER RT R=.08 60CPM



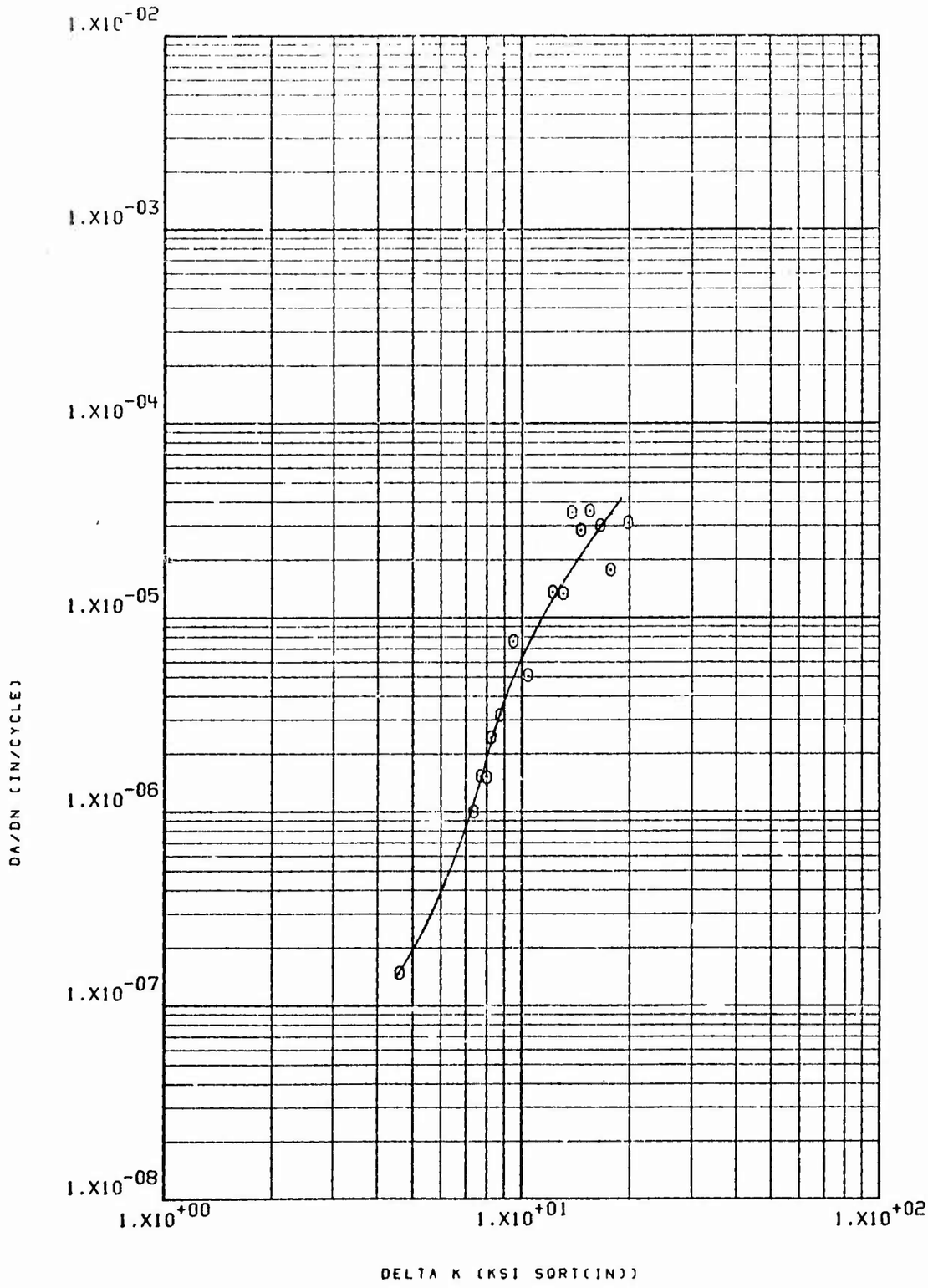
15 NRW 42-15 7075-T7651 ALUM LHA RT R=.08 3600CPM



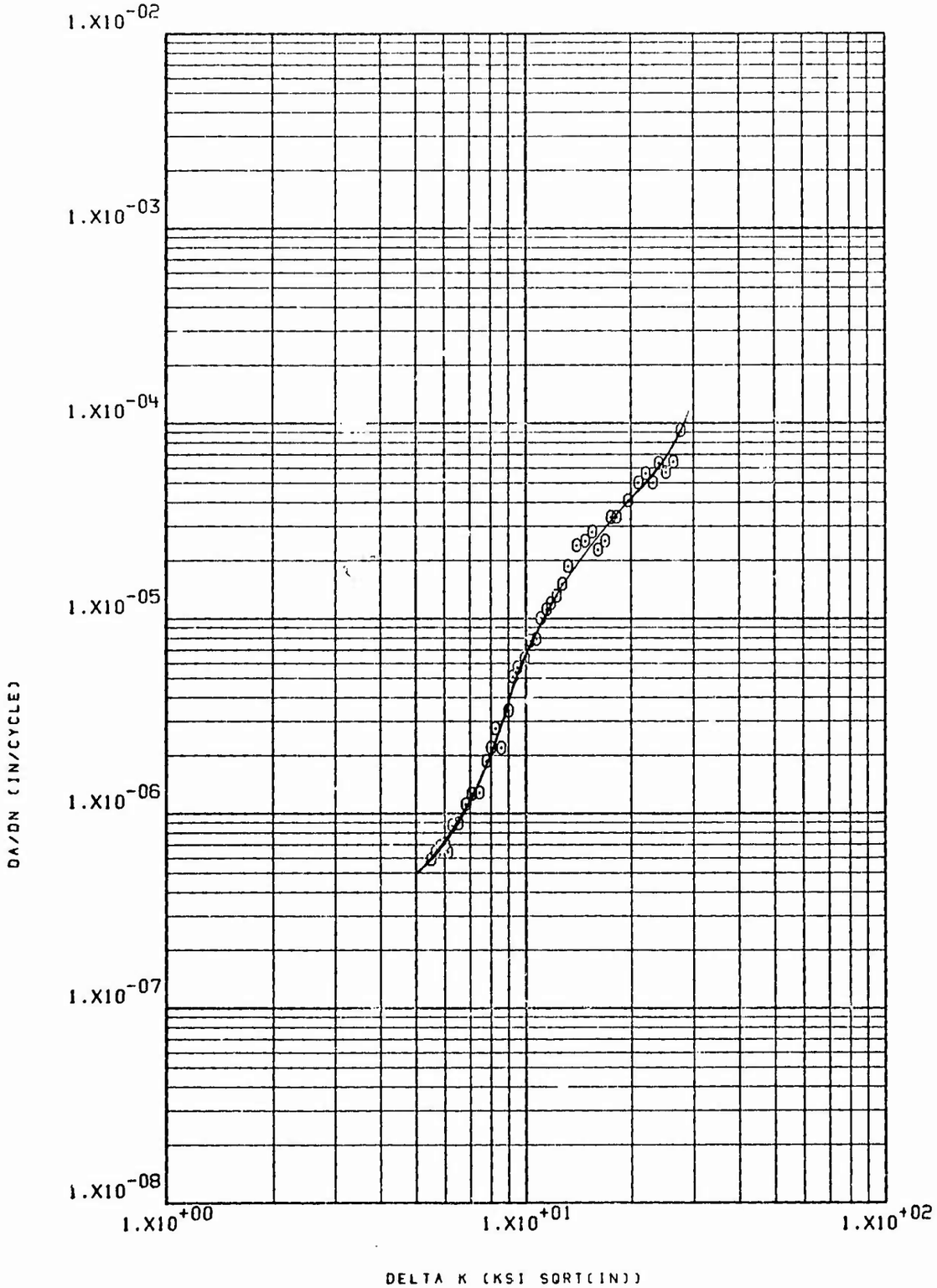
16 NWR 48-1 2219-T8511 L.H.A. EXTR. R.T. 360CPM R=.08



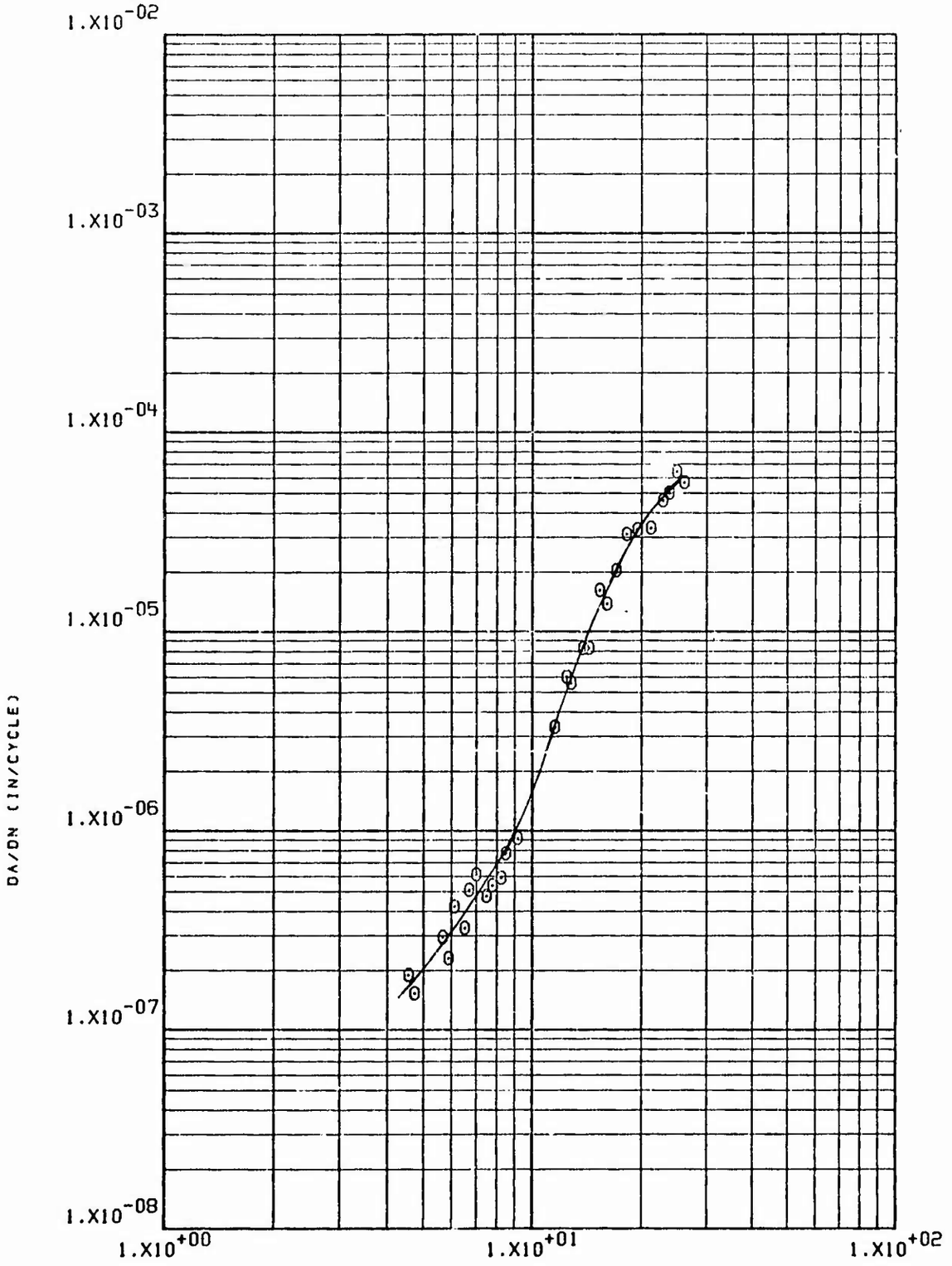
16 NWR 48-2 2219-T8511 EXTR. SUMP R.T. 60CPM R=.08



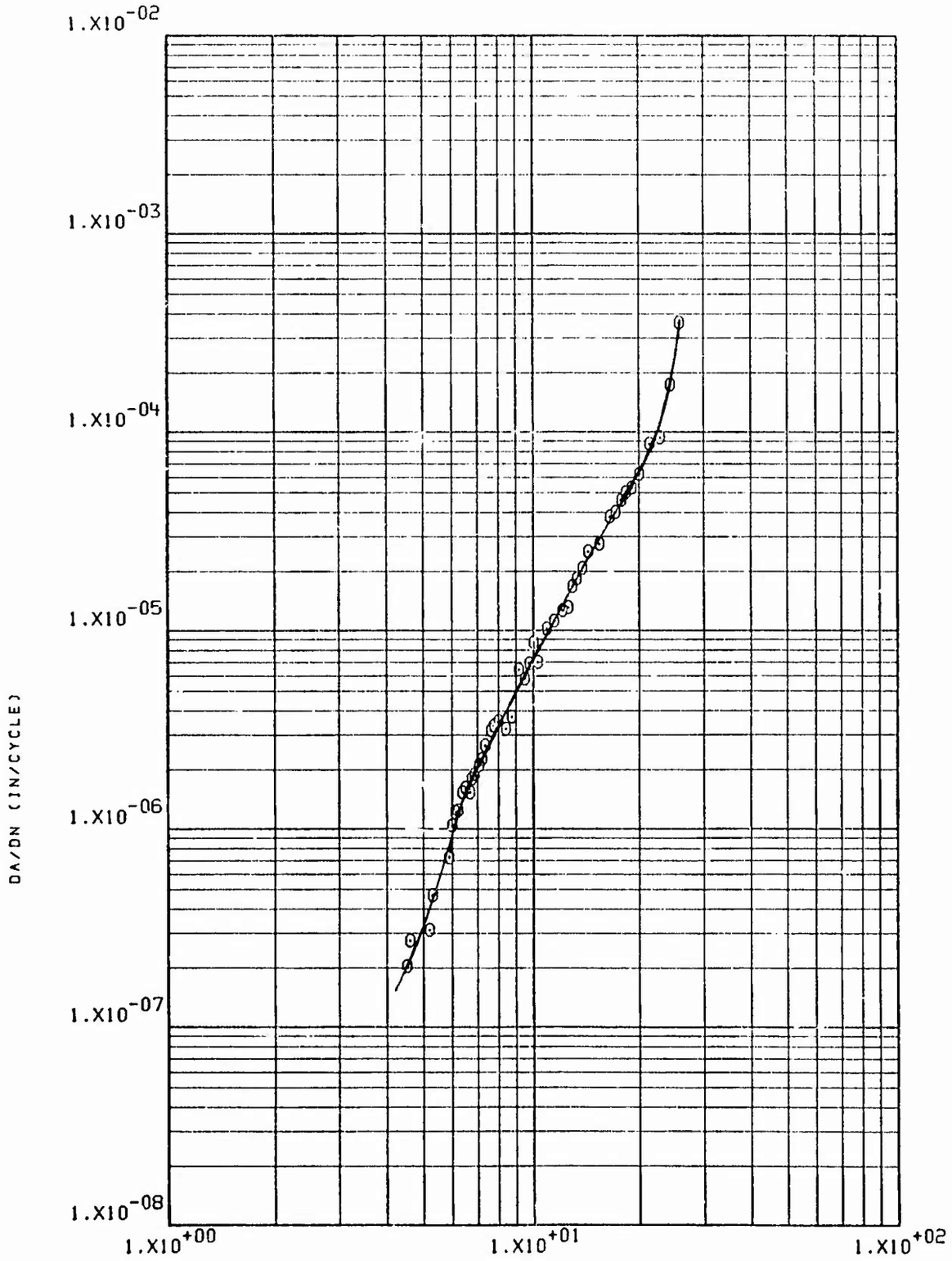
16 HRW 48-3 2219-T8511 EXTR. SUMP R.T. 60CPM R=.08



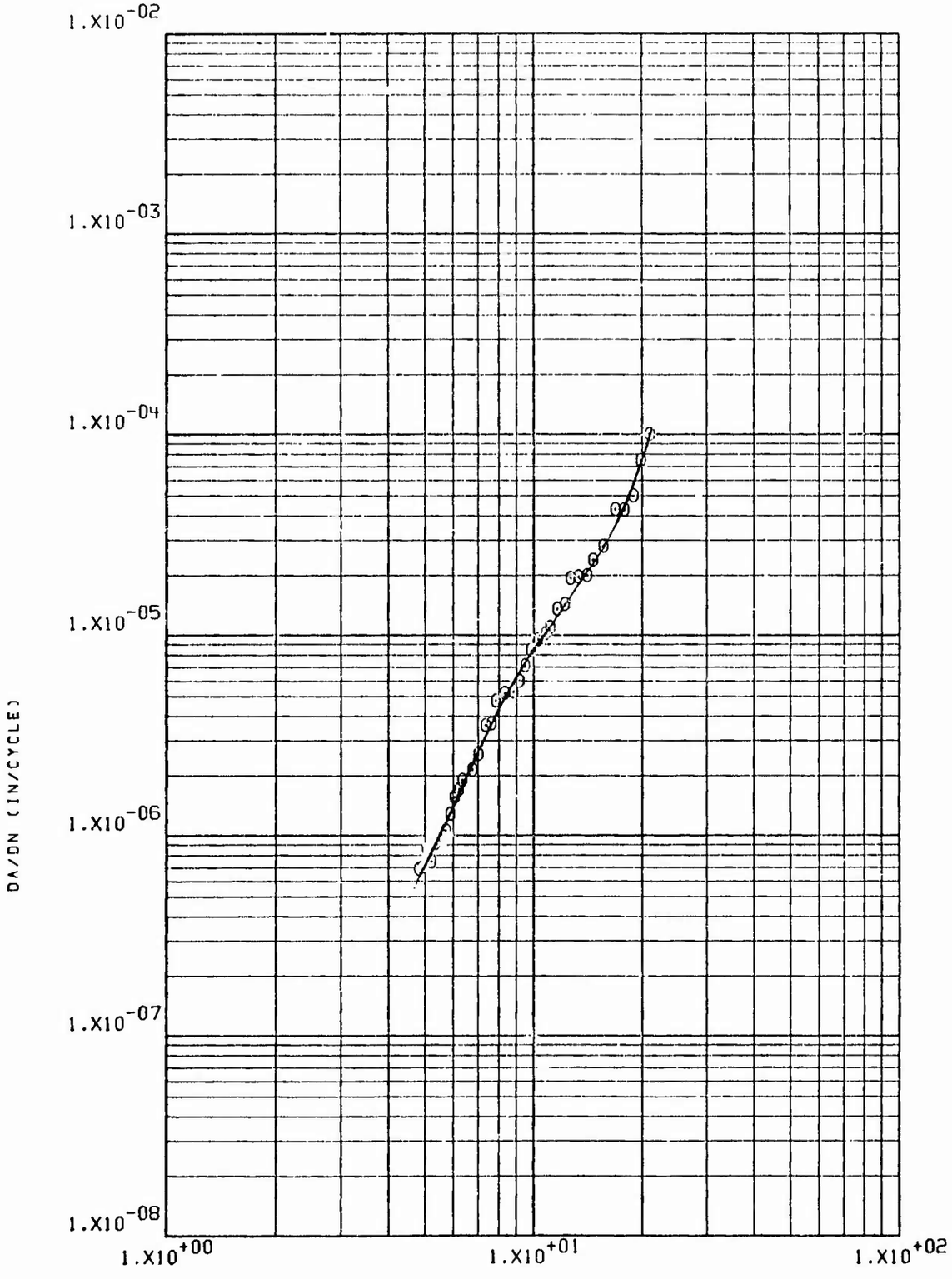
16 NRW 48-4 2219-T8511 EXTR. L.H.A. R.T. 360CPM R=.30



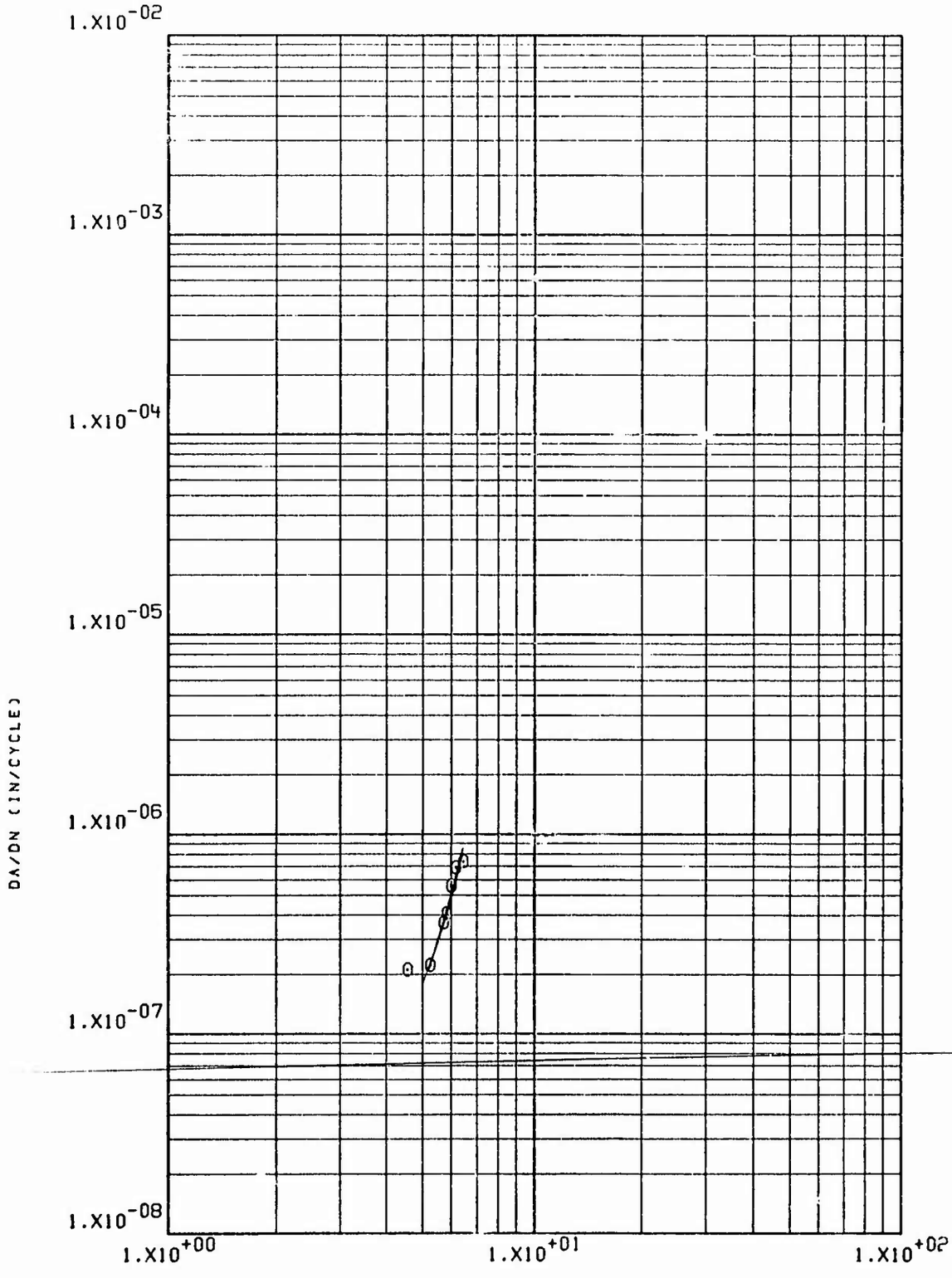
16 NRW 48-5 2219-T8511 EXTR LHA 360CPM R=.08 RT



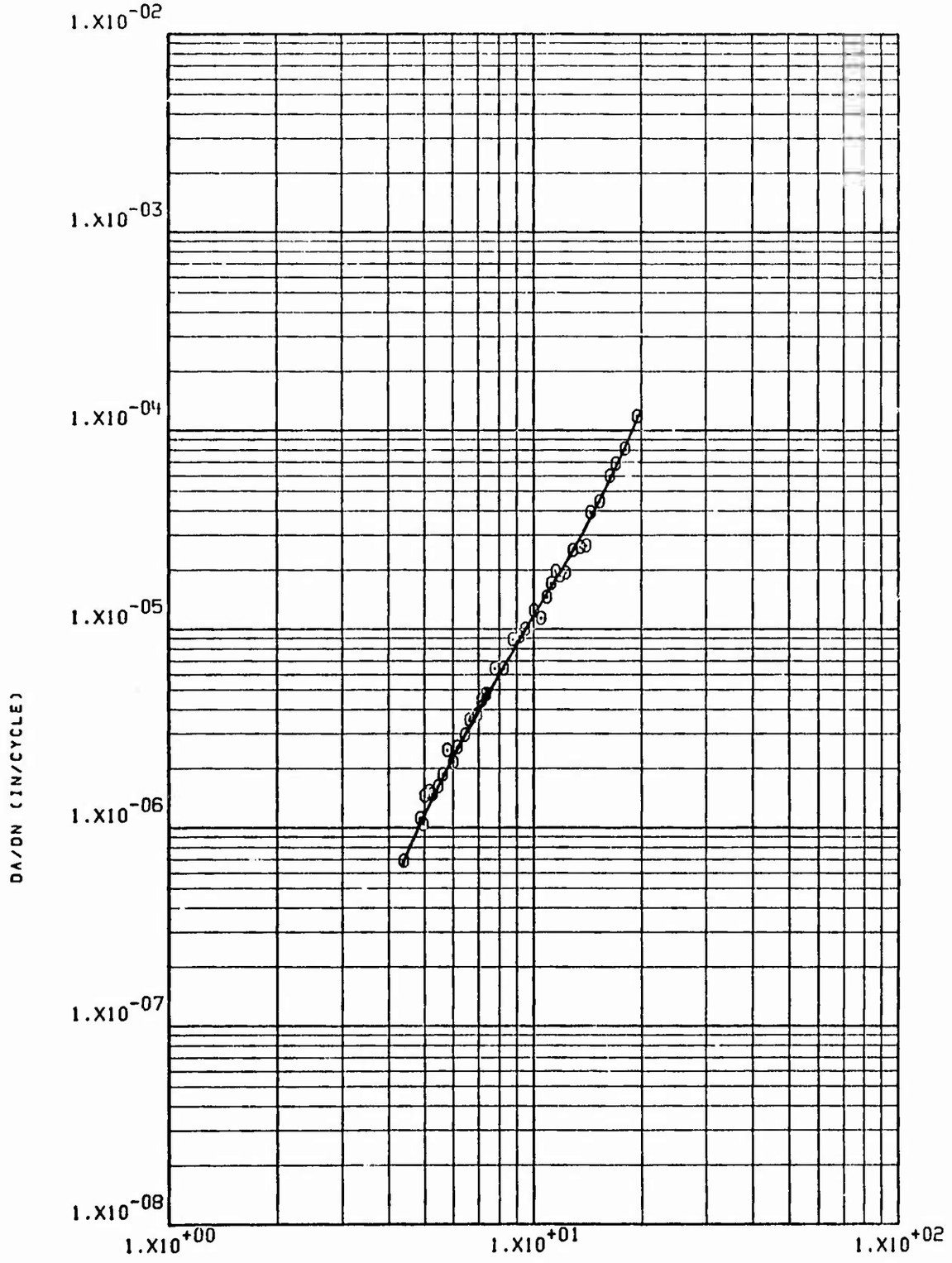
18 NRW 51-1 7075-T7651 L.H.A. R.T. 60CPM R=.08



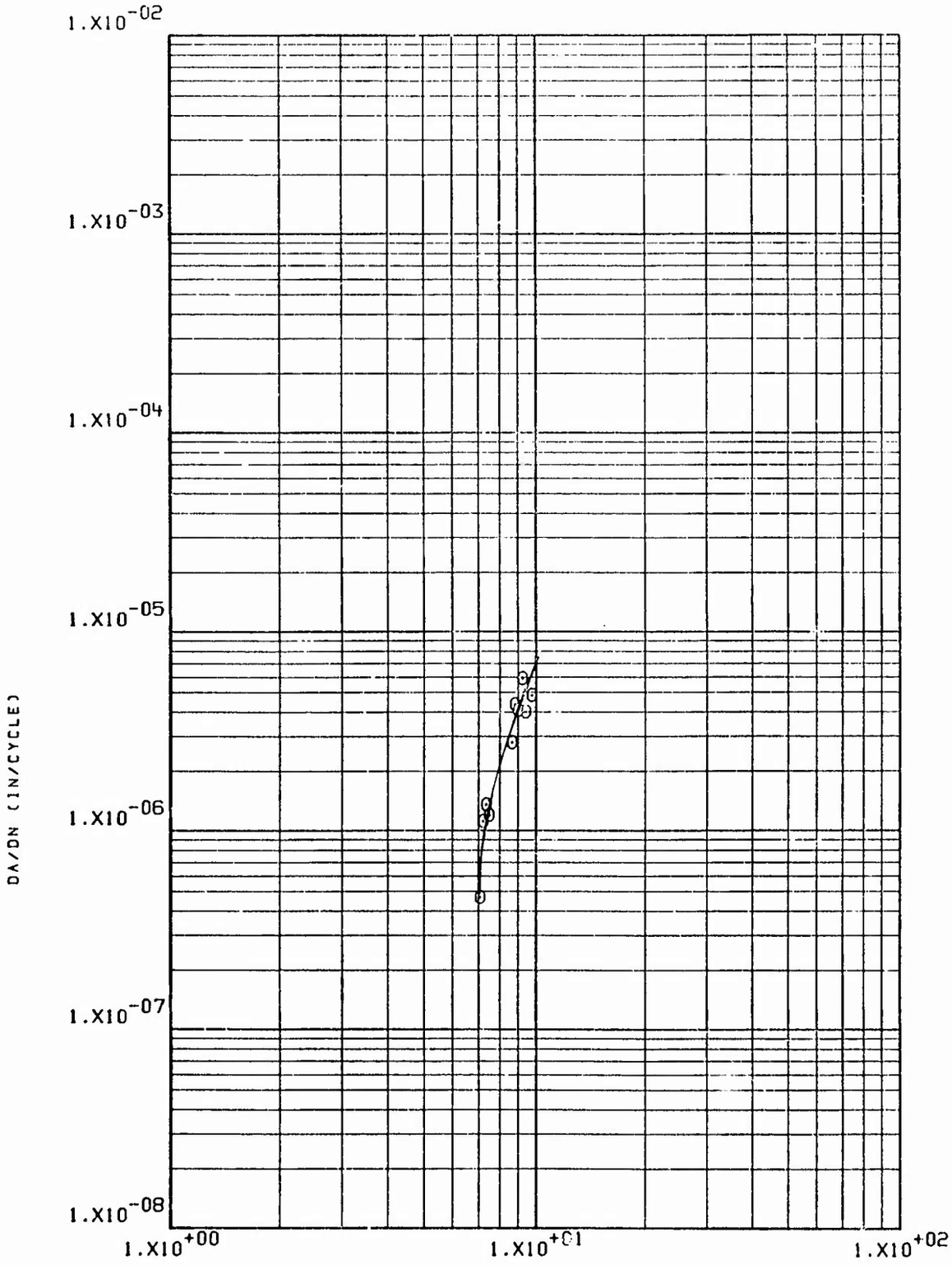
18 NRW 51-2 7075-T7651 SUMP R.T. 60CPM R=.08



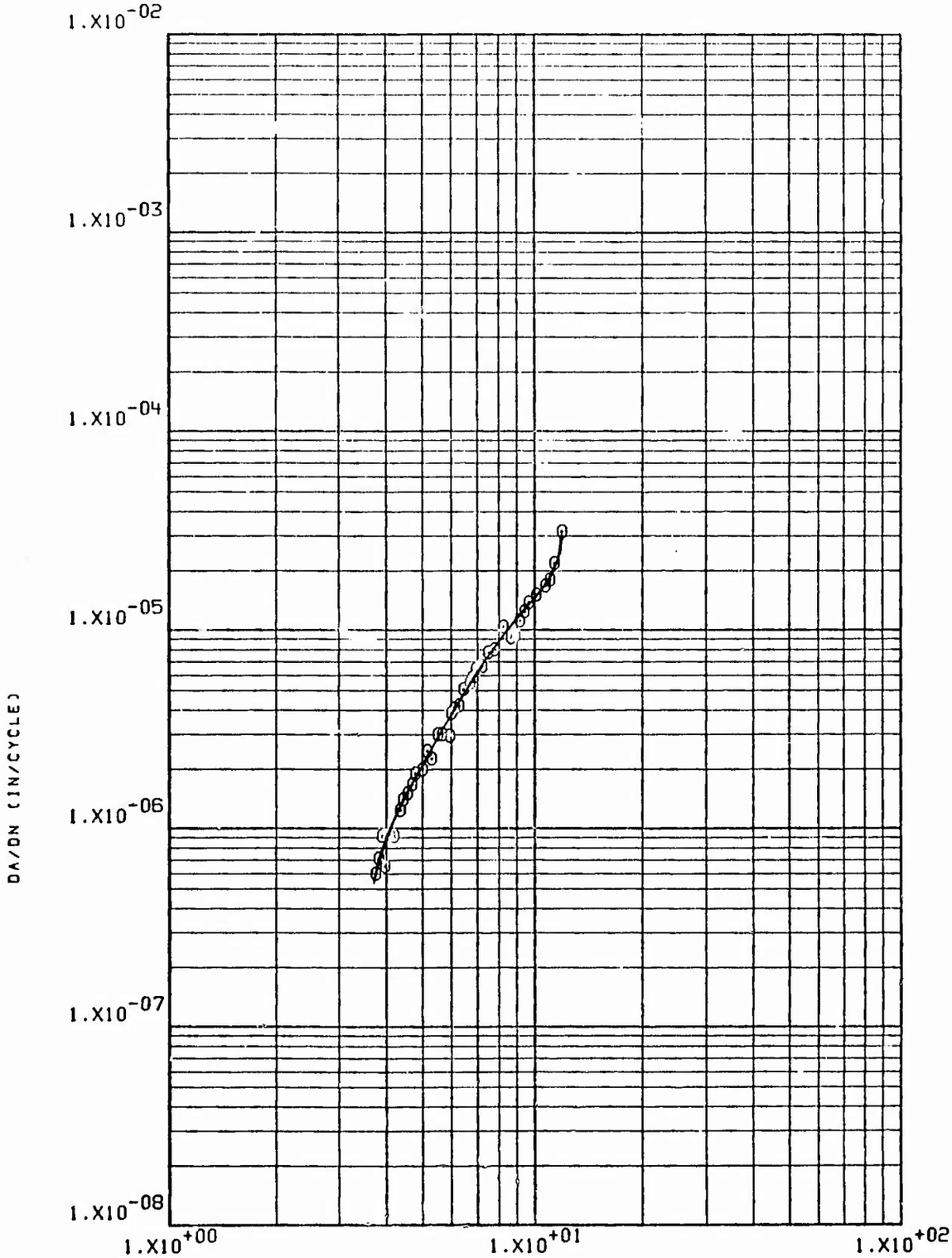
18 NRW 51-3 7075-T7651 L.H.A. R.T. 360CPM R=.08



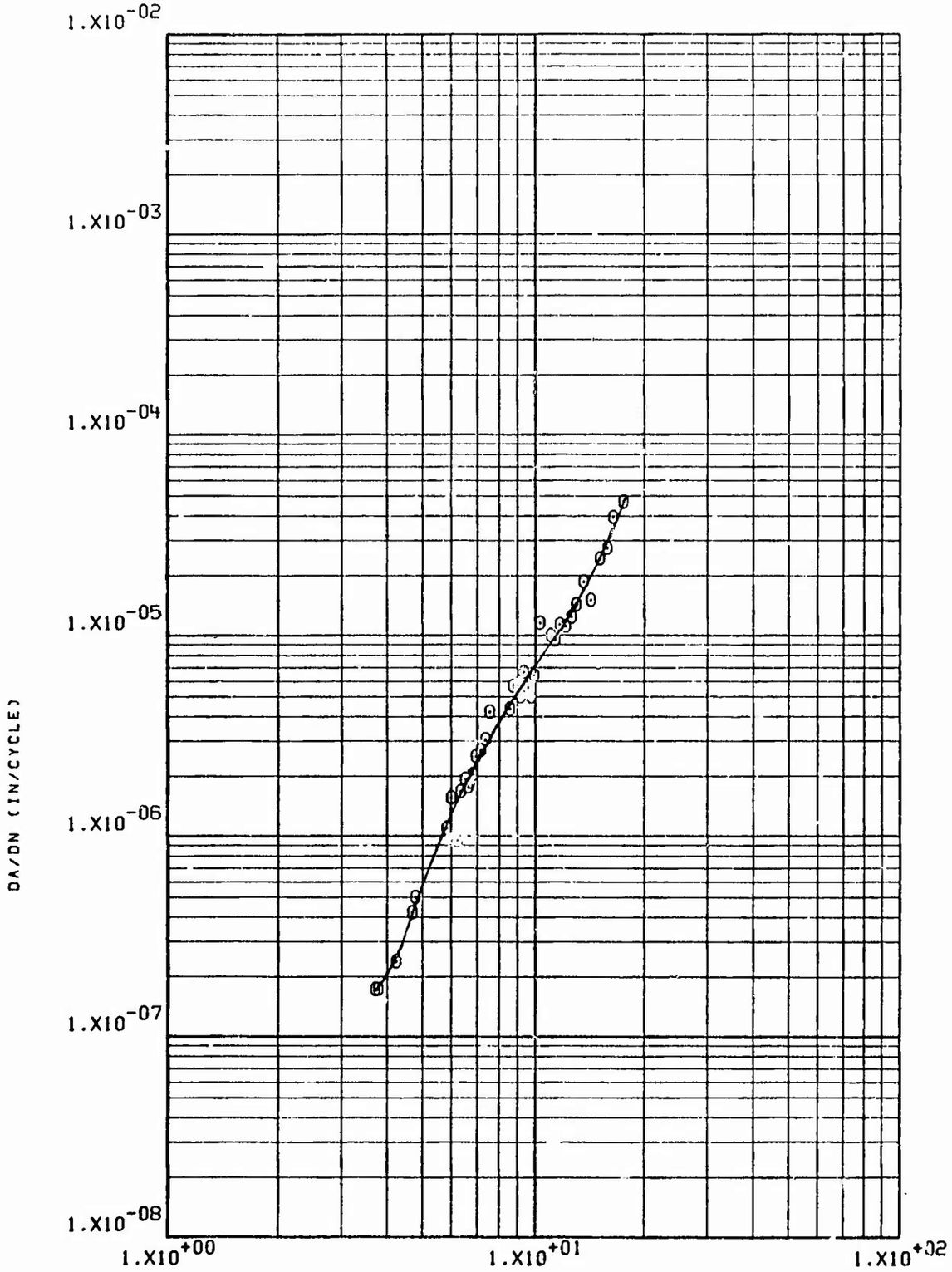
18 NRW 51-4 7075-T7651 SUMP R.T. 60CPM R=.3



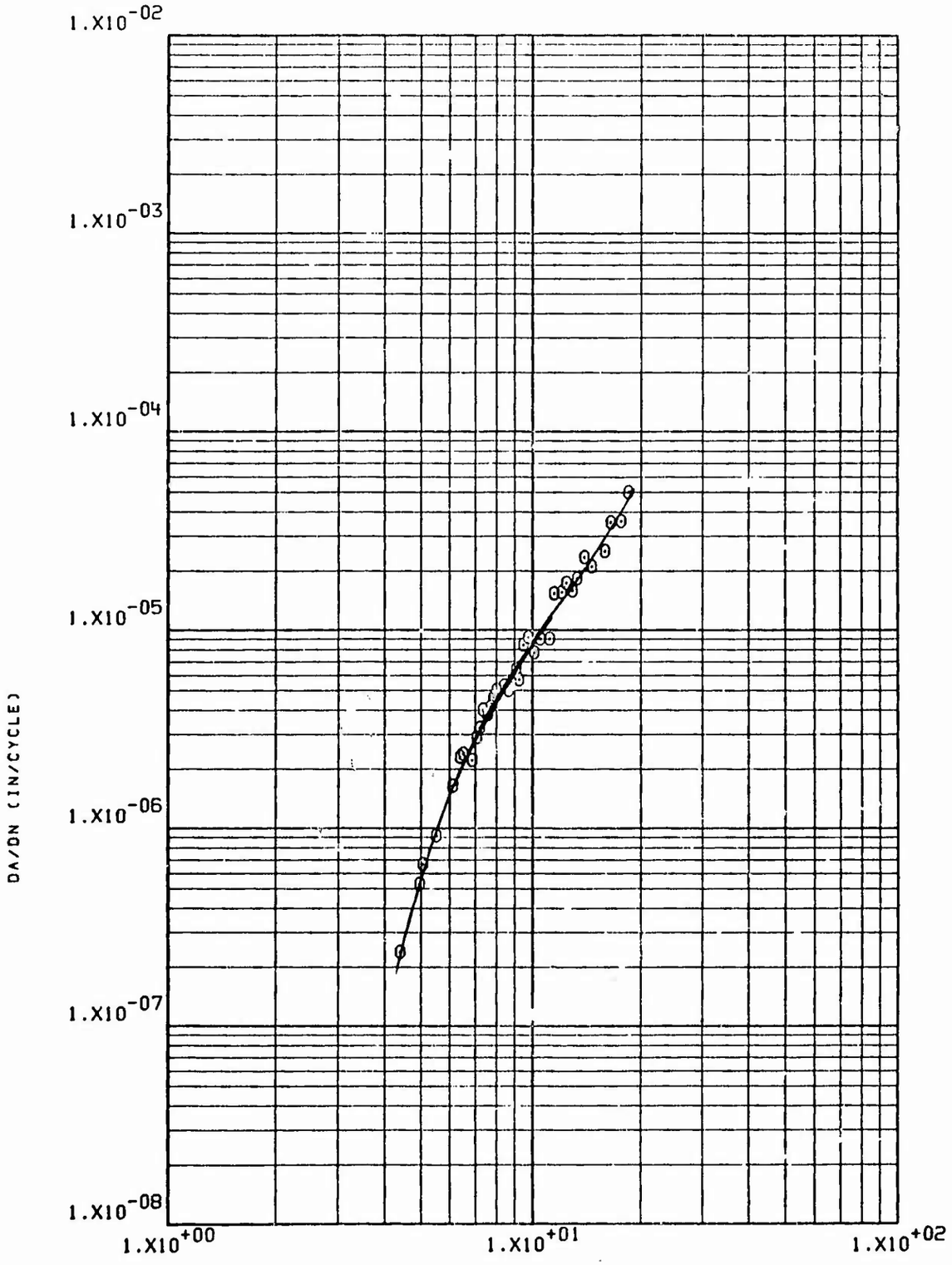
18 NRW 51-5 7075-T7651 SUMP RT 6CPM R=+.08



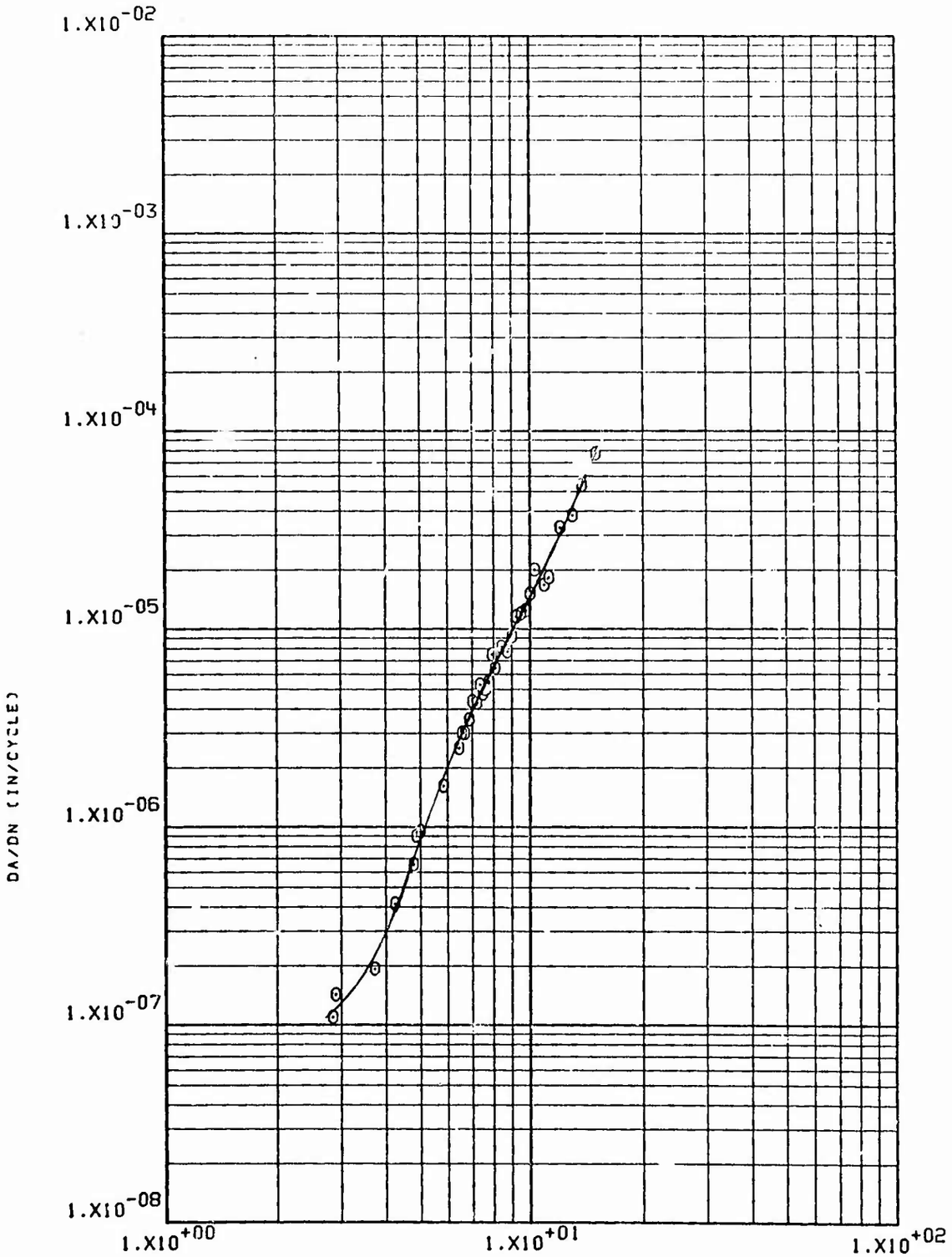
18 NRW 51-6 7075-T7651 SUMP R.T. 60CPM R=.5



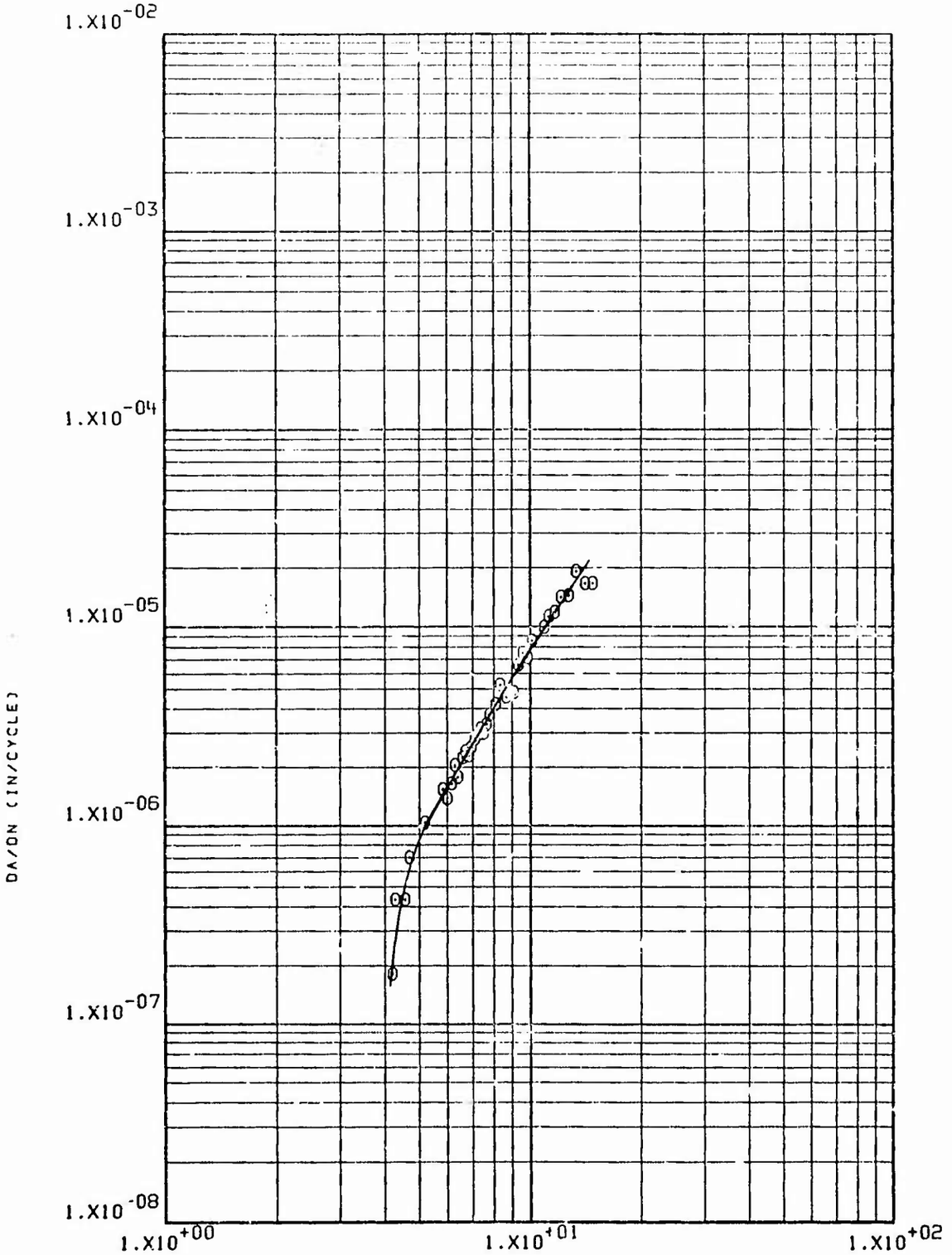
18 NRW 51-7 7075-T7651 LHA RT R=.3 360CPM



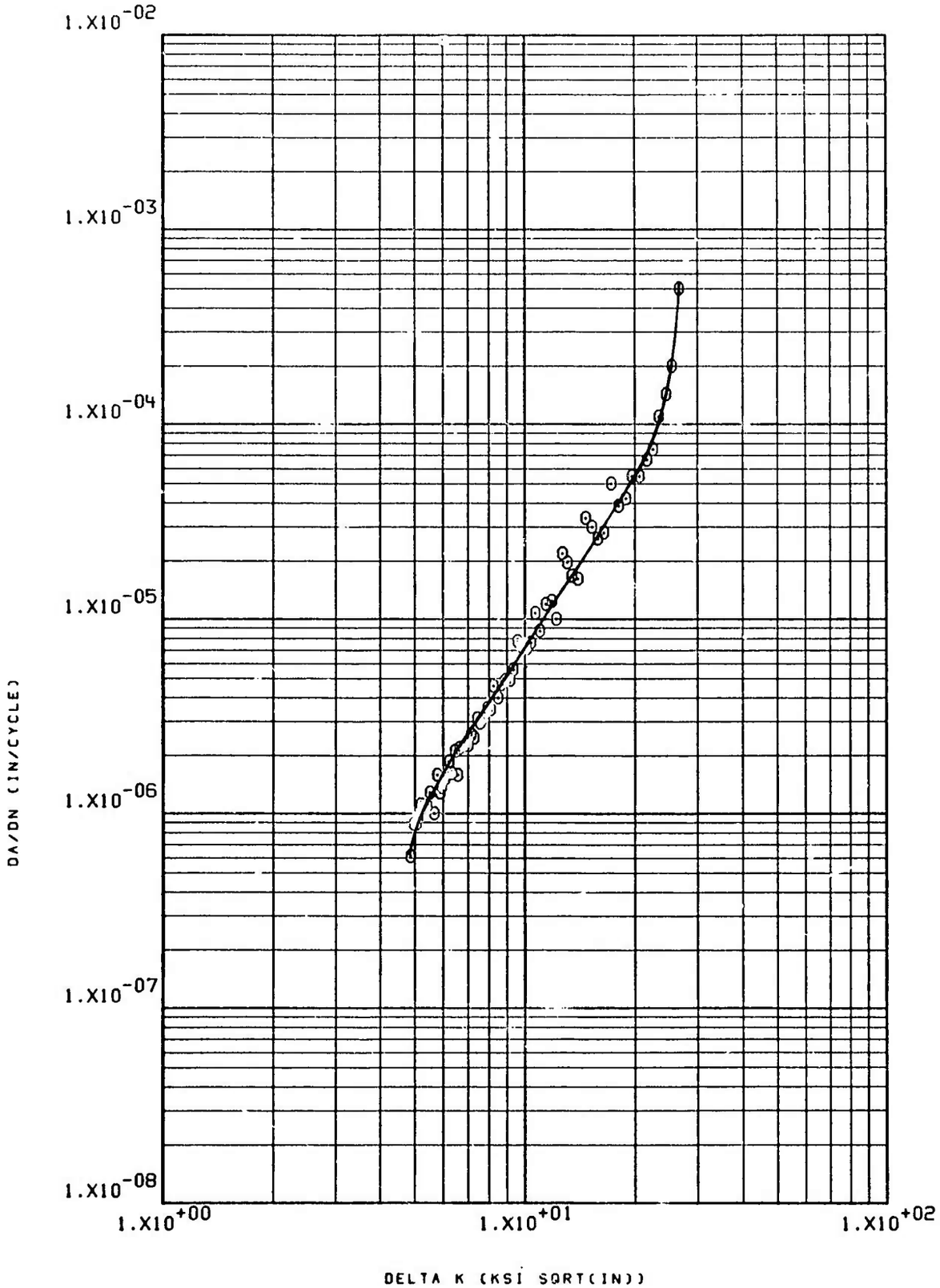
18NRW 51-8 7075-T7651 SHOPCLNG SOLV RT R=.08 60CPM



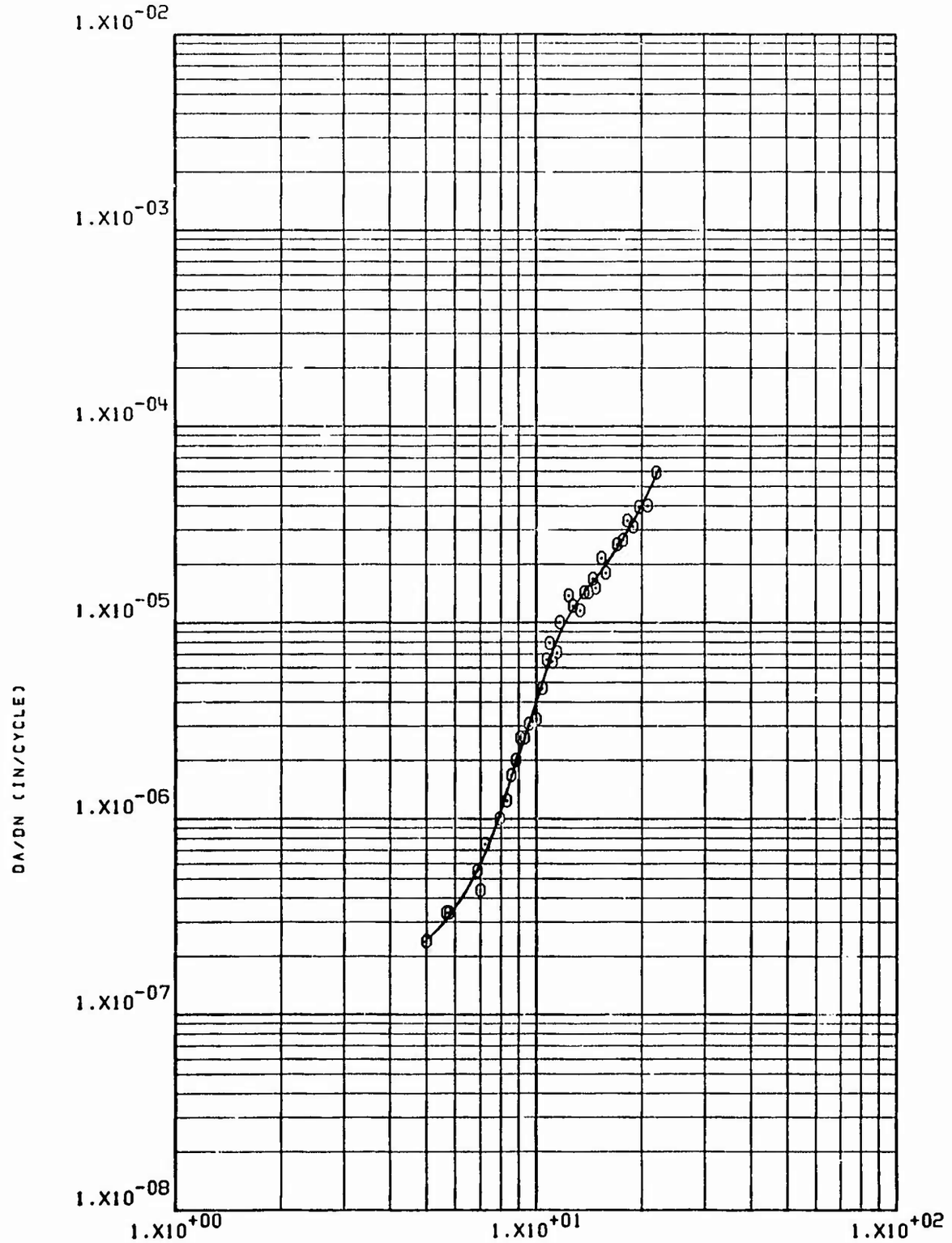
18NRW 51-9 7075-T7651 LHA RT R=.5 360CPM



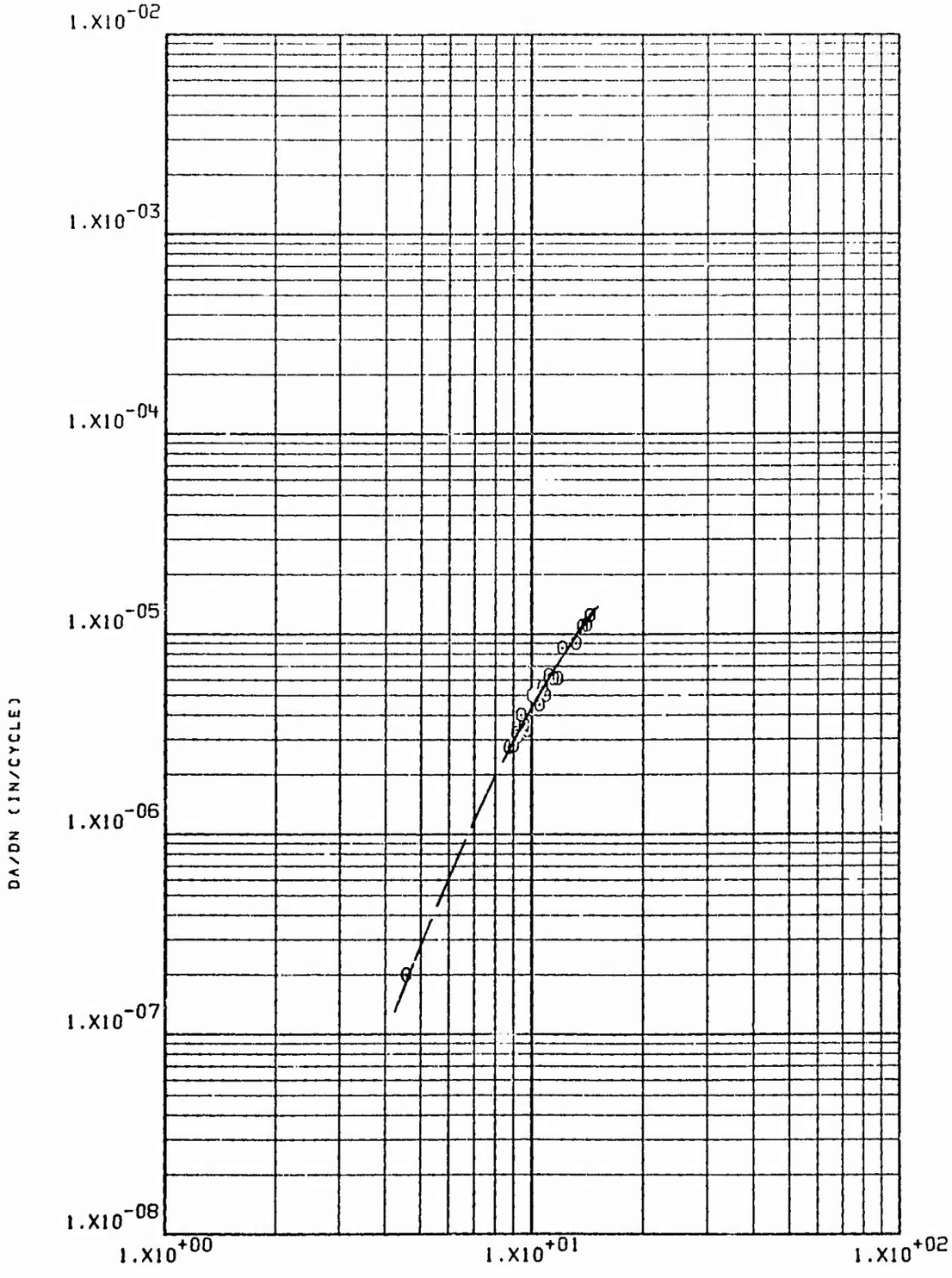
18 NRW 51-10 7075-T7651 LHA 265F R=.08 360CPM



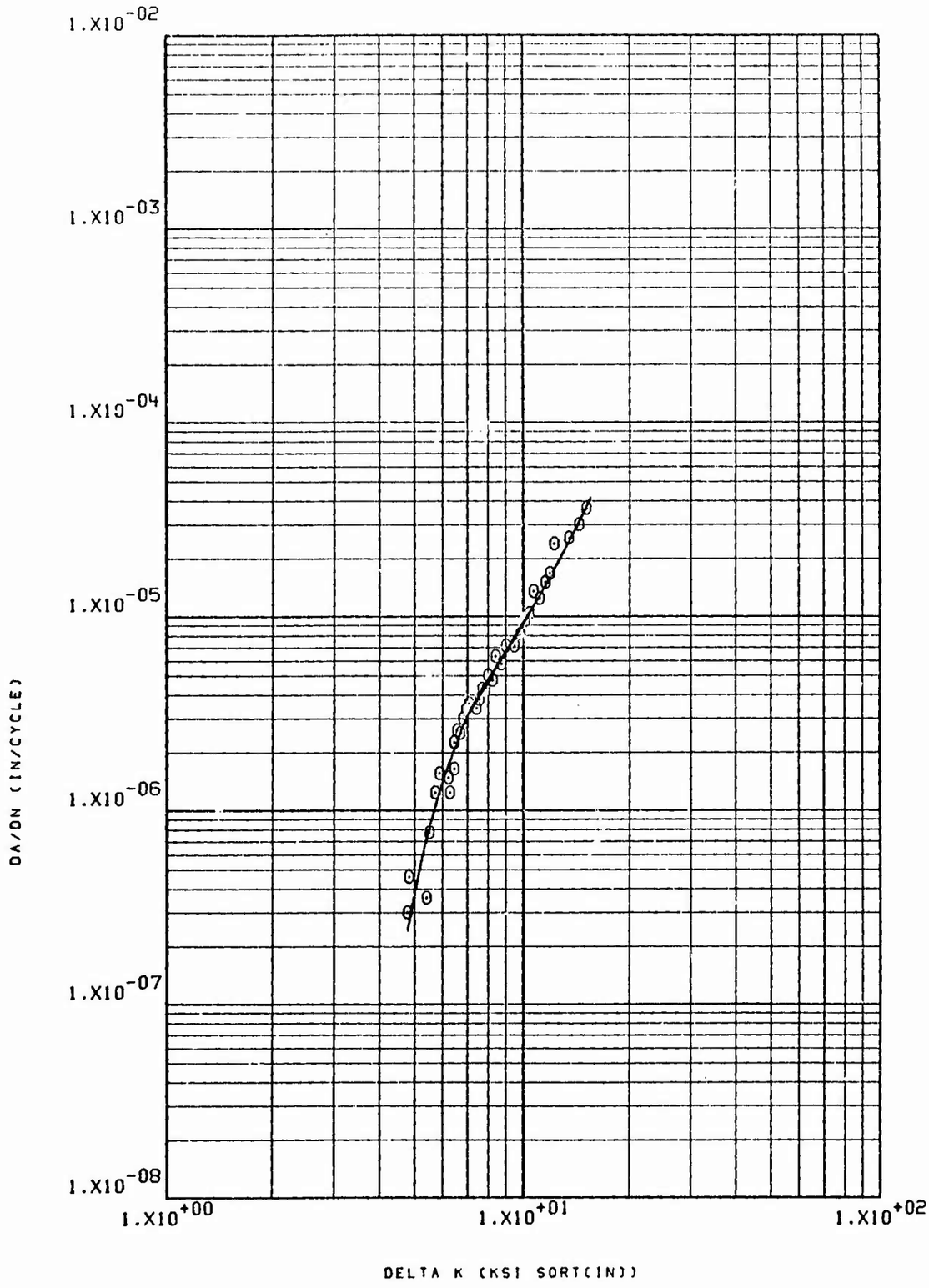
18 NRW 51-12 7075-T7651 LHA 265F R=.08 60 CPM



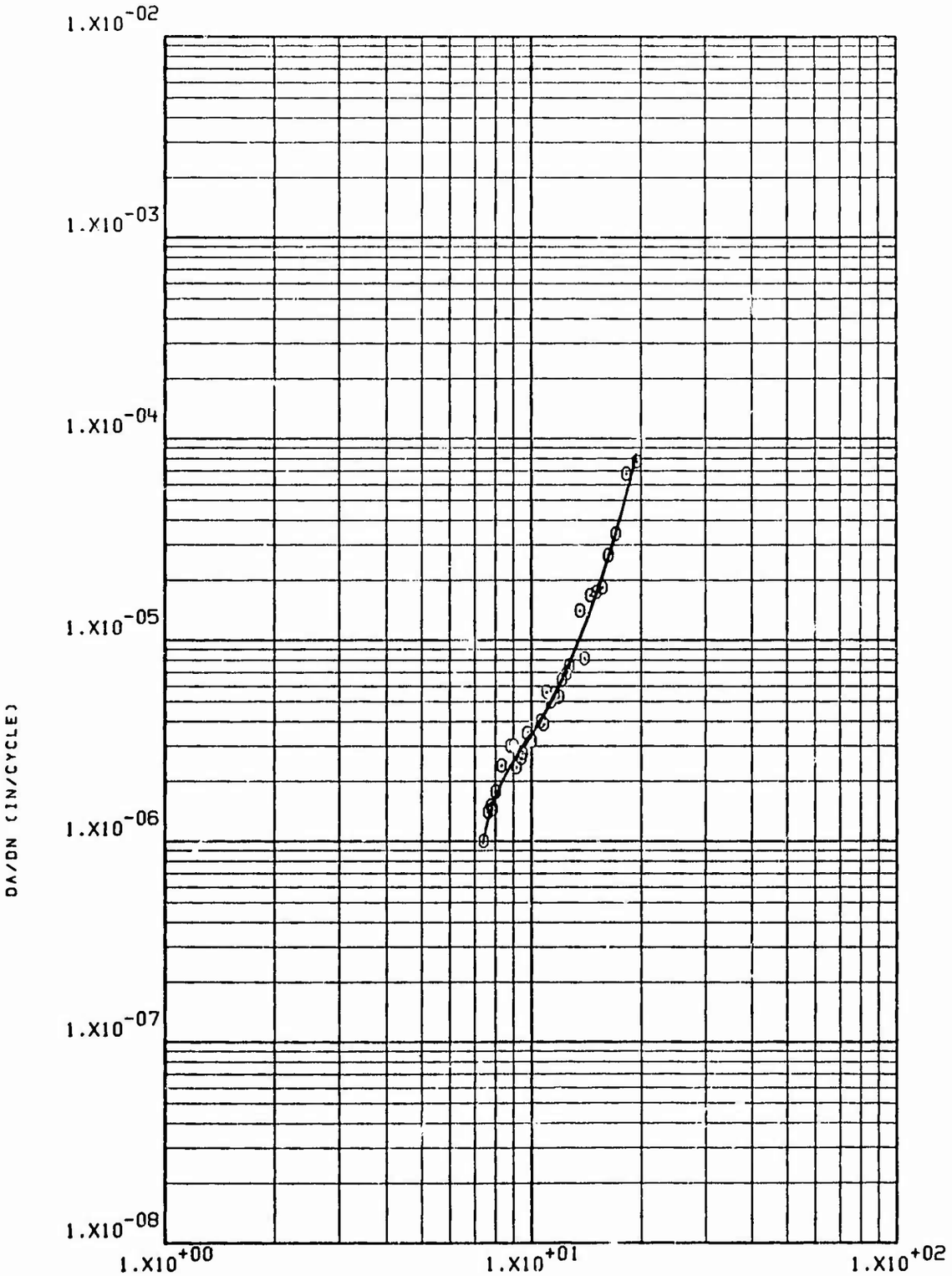
18 NRW 51-13 7075-T7651 L.H.A. R.T. 360CPM R=.08



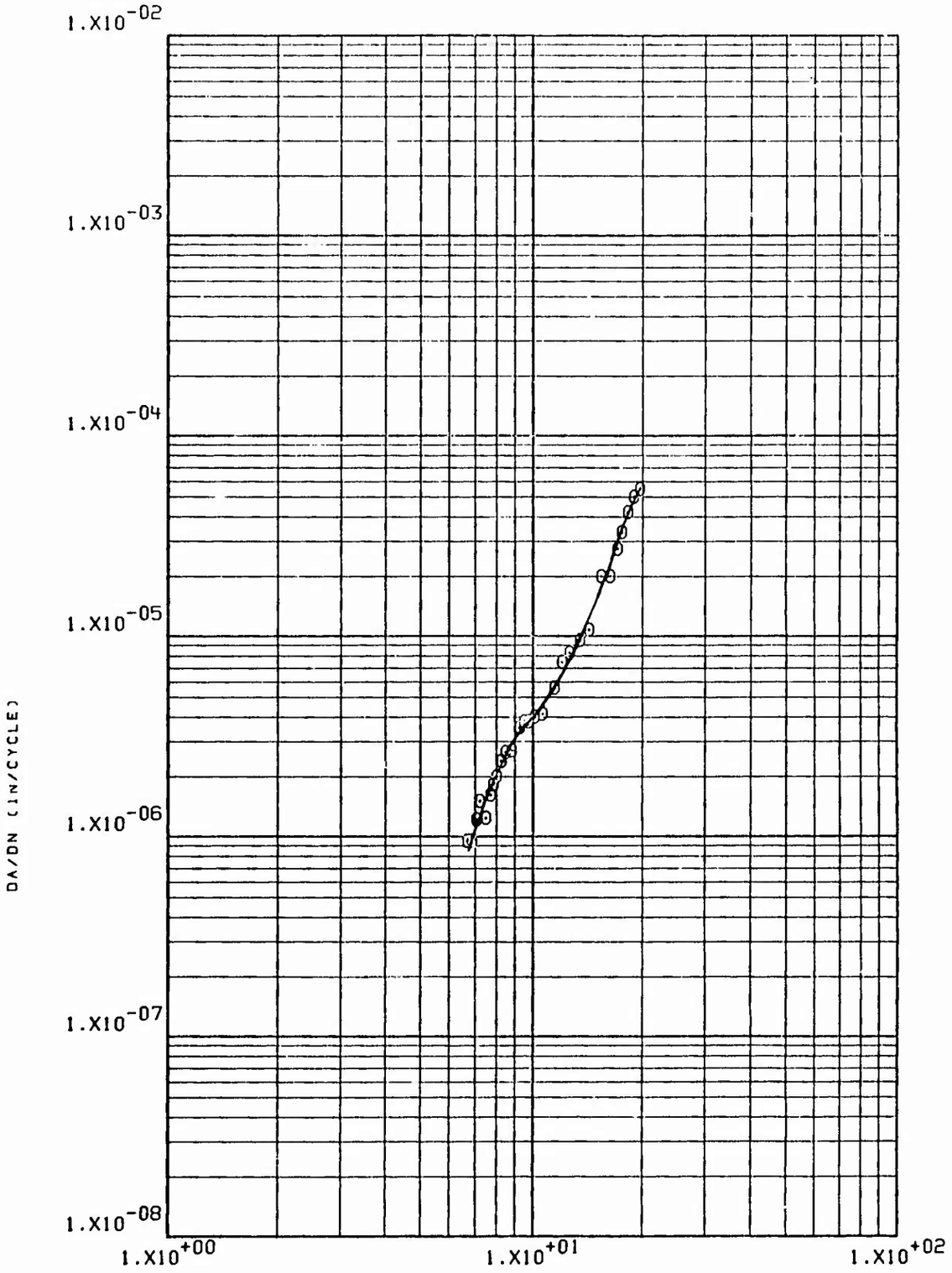
18 NRW 51-14 7075-T7651 L.H.A. R.T. 360CPM R=.08



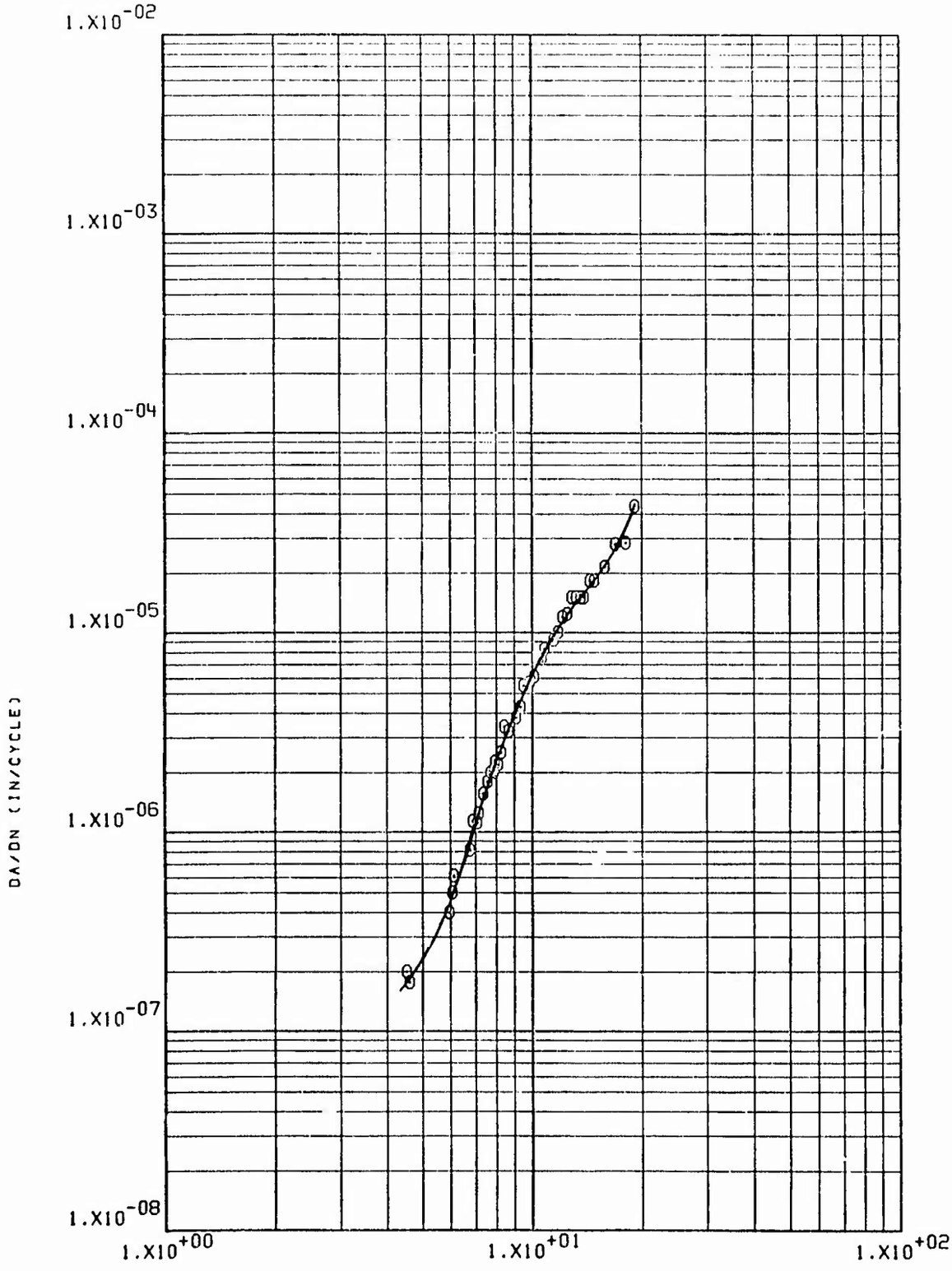
18NWR 51-15 7075-T7651 SHOP CLN SOLV RT R=.08 60CPM



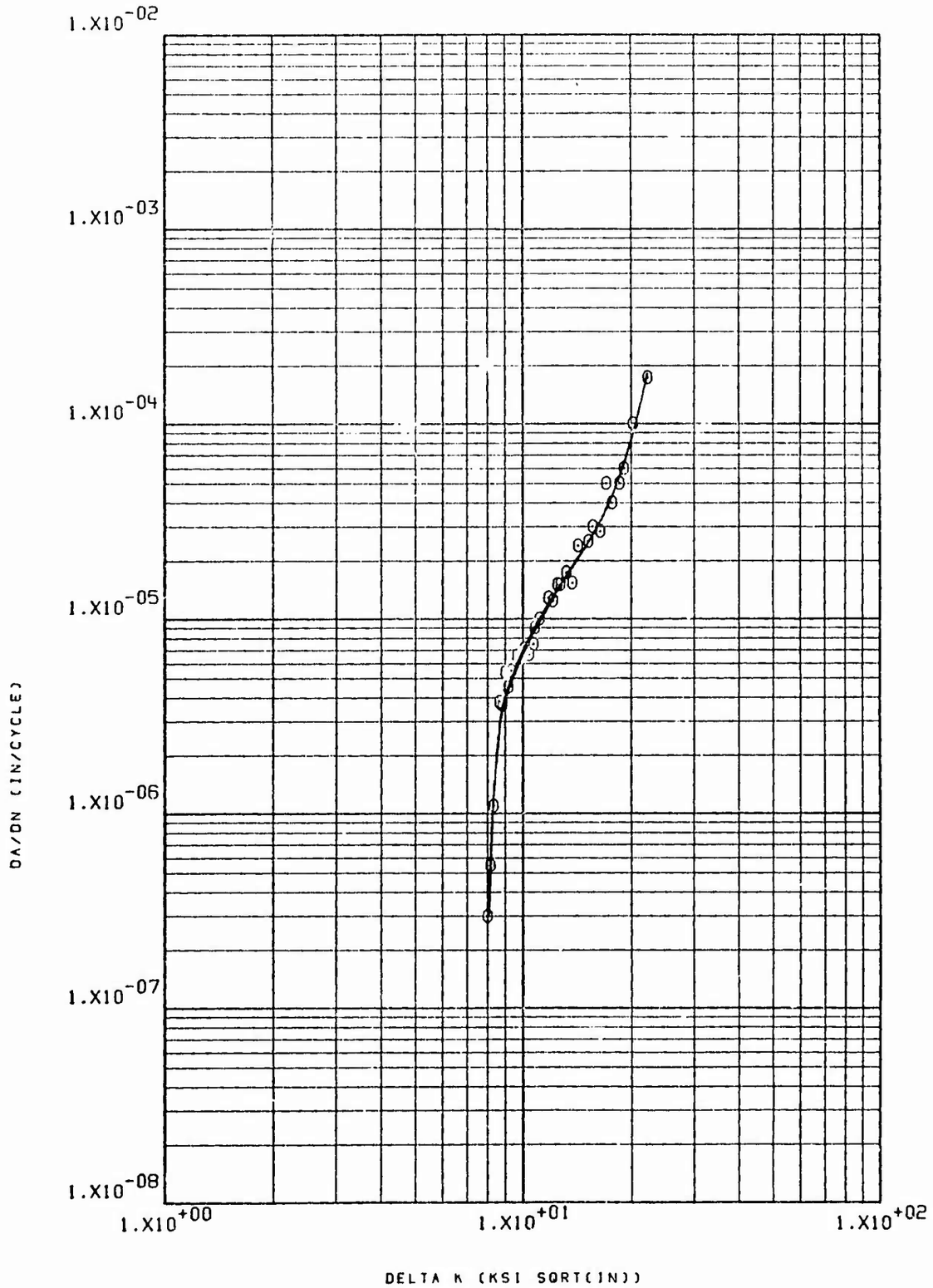
18 NWR 51-16 7075-T7651 LHA RT R=.08 360CPM



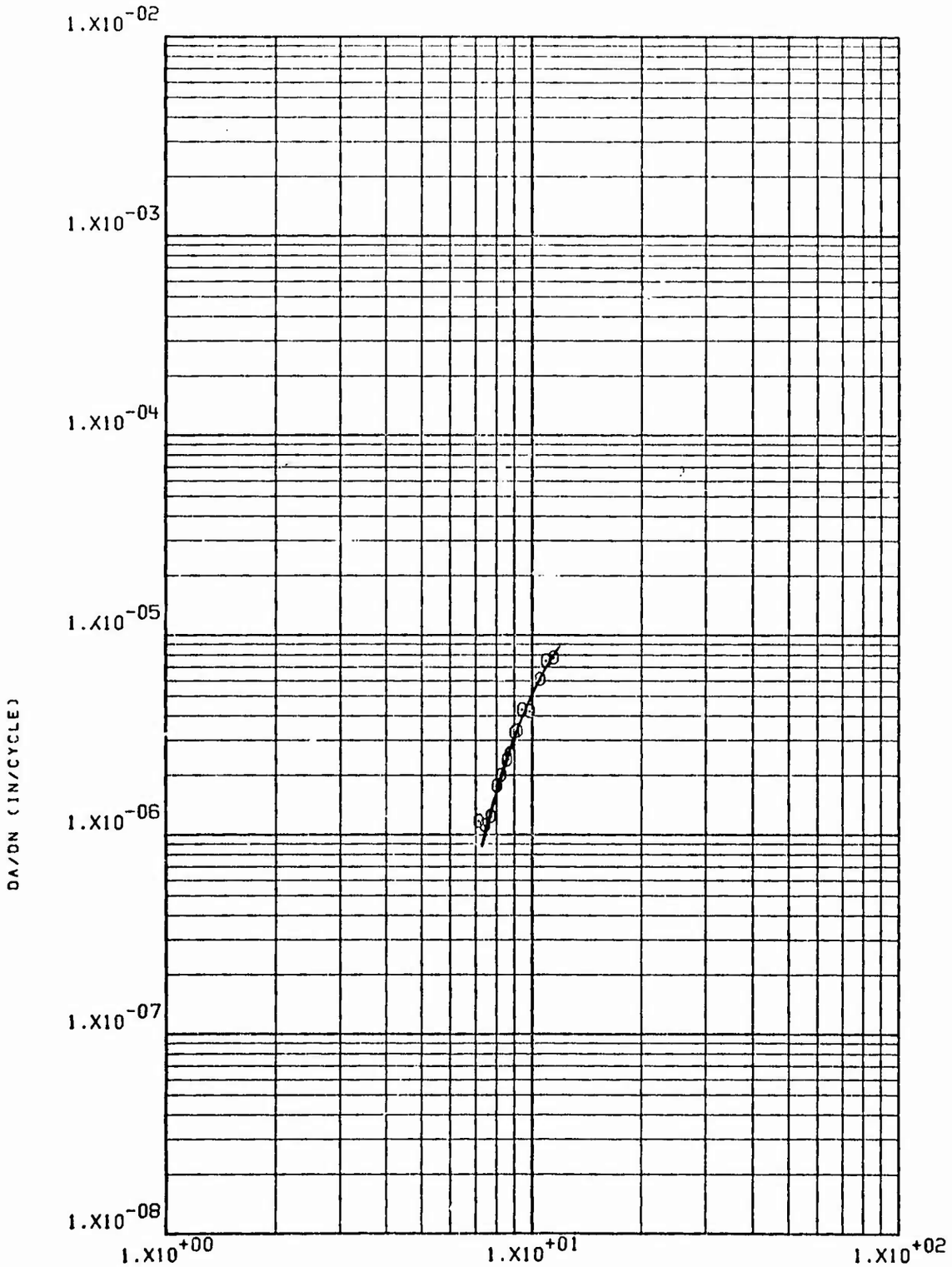
18 NWR 51-17 7075-T7651 L.H.A. R.T. 360CPM R=.08



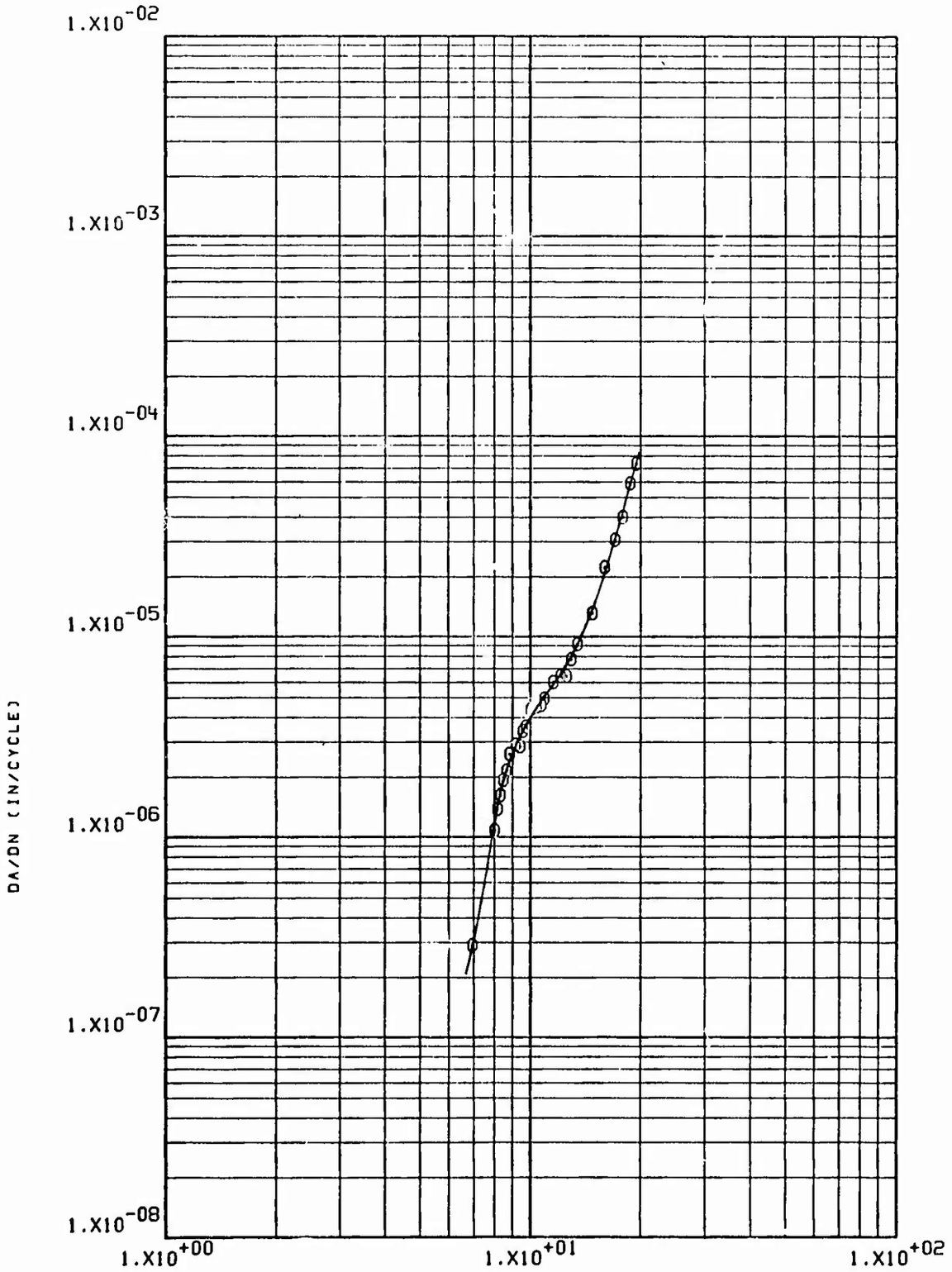
18 NRW 51-60 7075-T7351 L.H.A. R.T. 60CPM R=.08



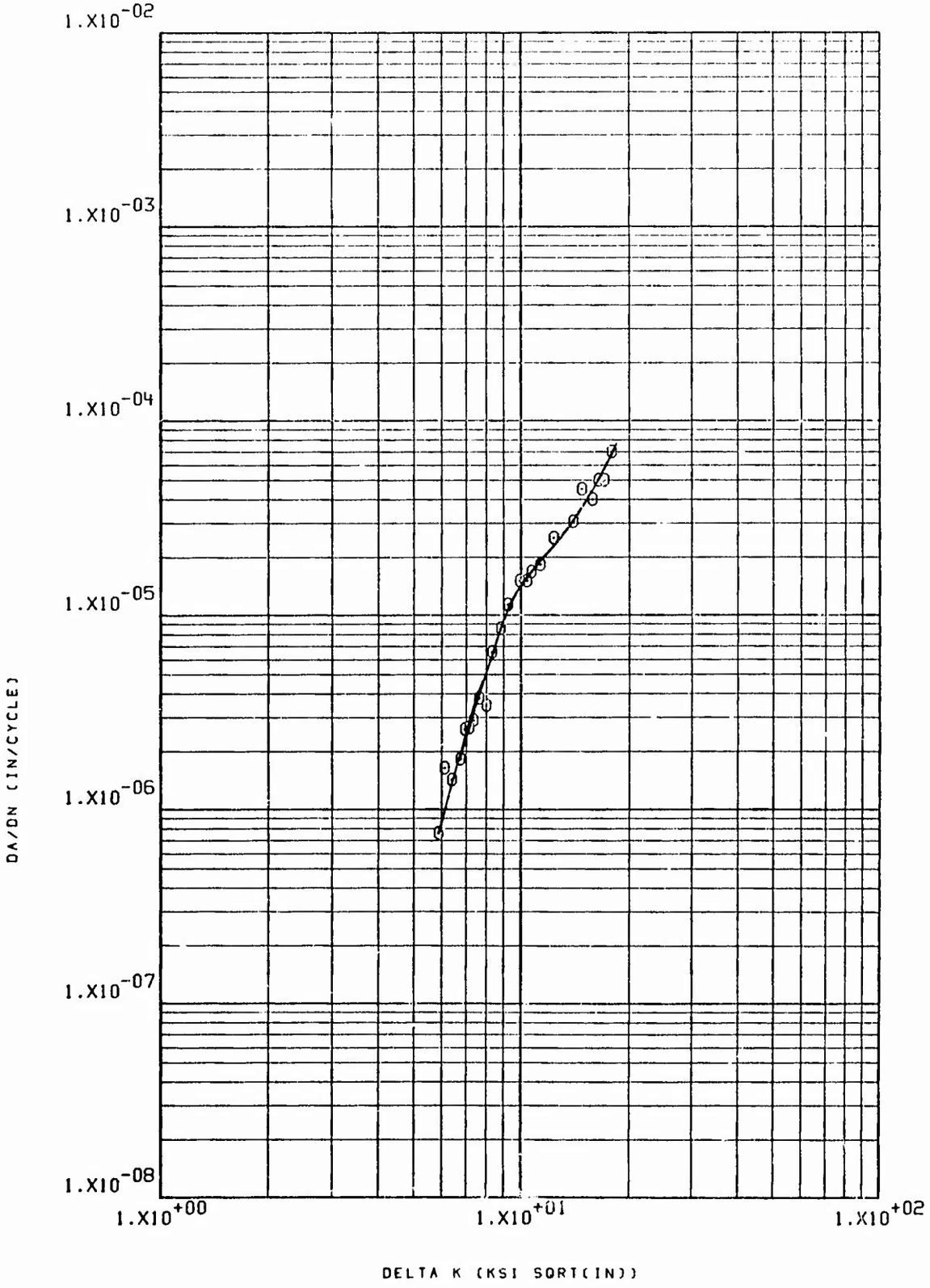
18 NRW 51-61 7075-T7351 L.H.A. R.T. 360CPM R=.3



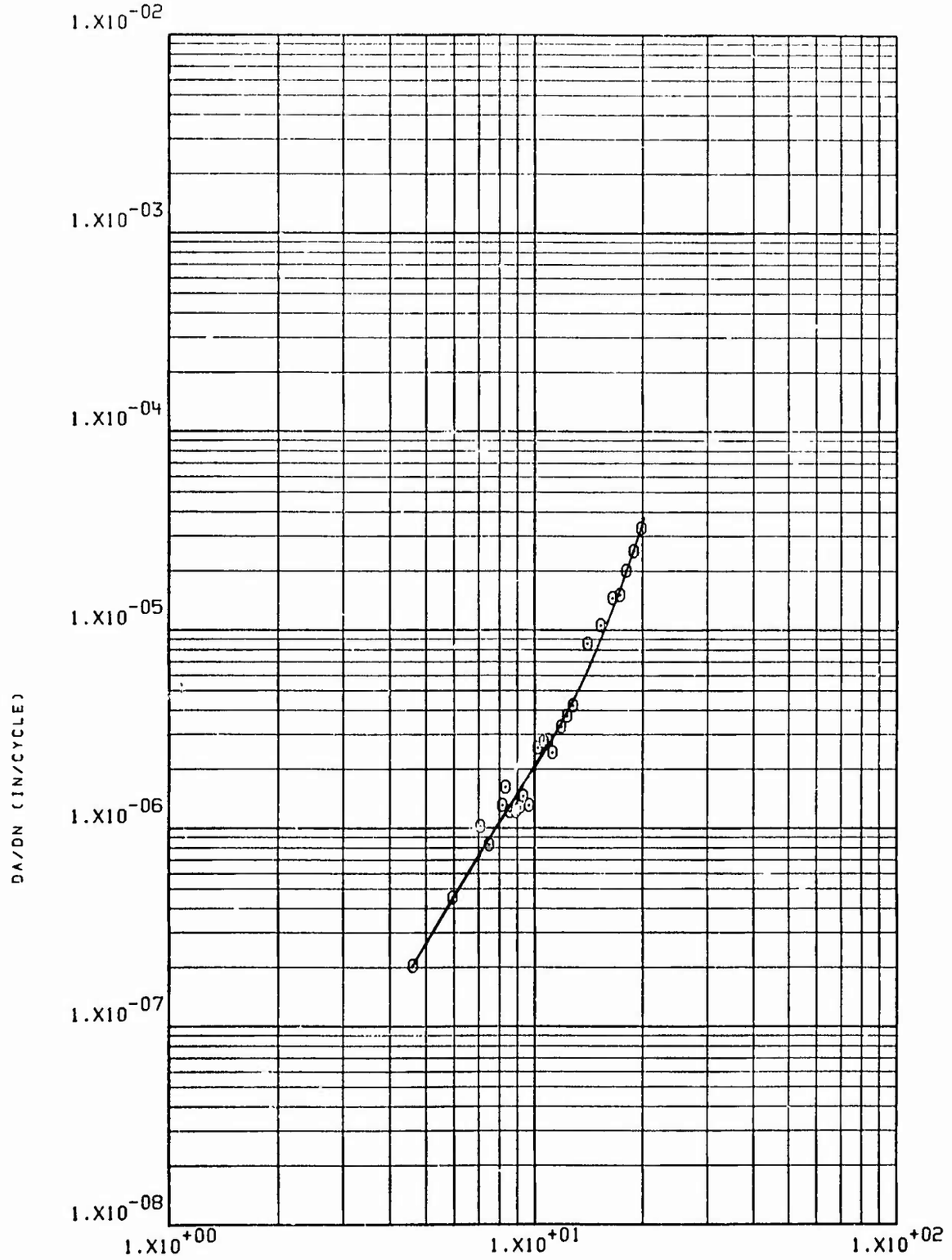
18 NRW 51-62 7075-T7351 L.H.A. R.T. 360CPM R=.08



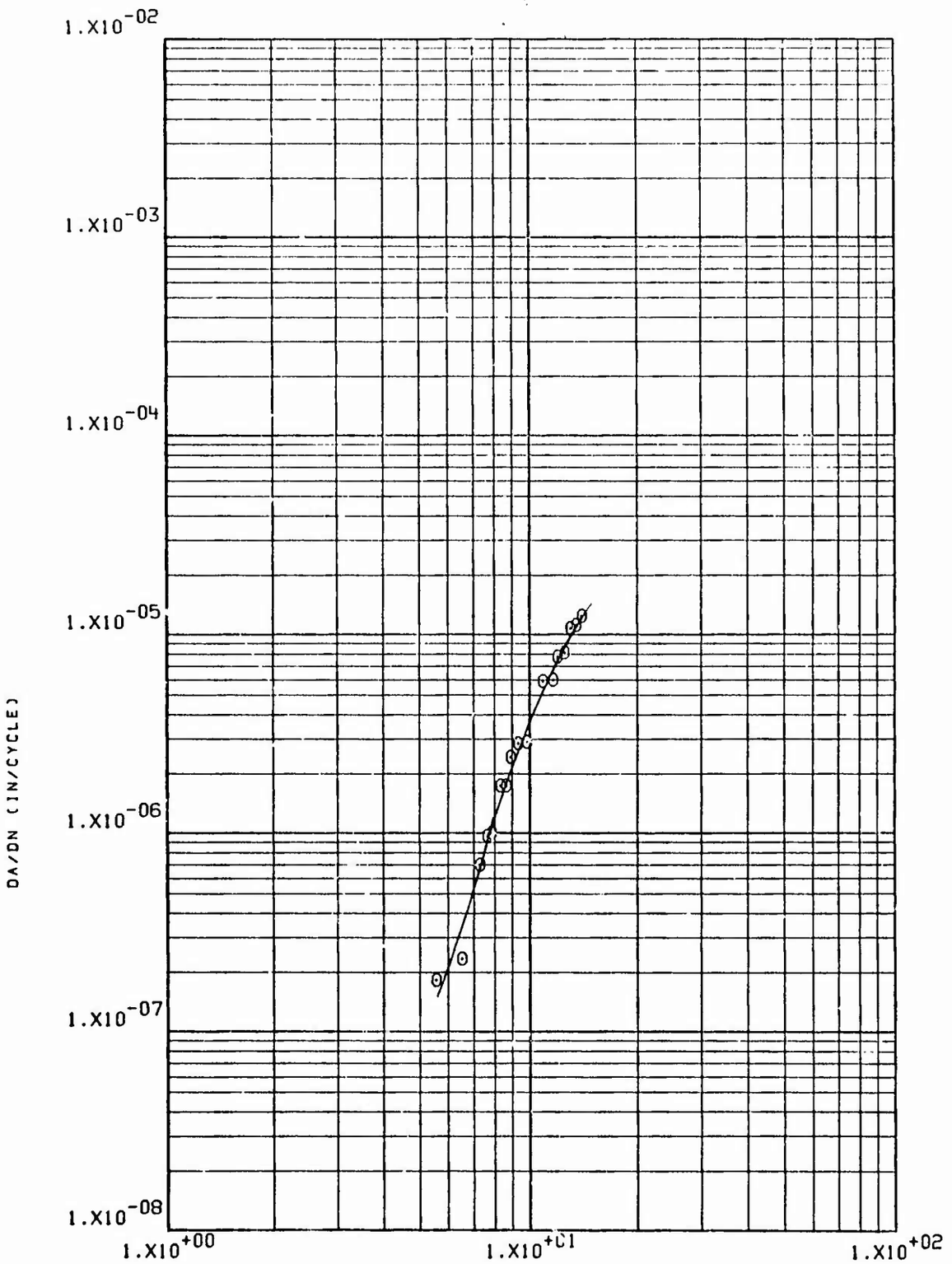
18NWR51-63 7075-T7351 LHA RT 360CPM R=.08



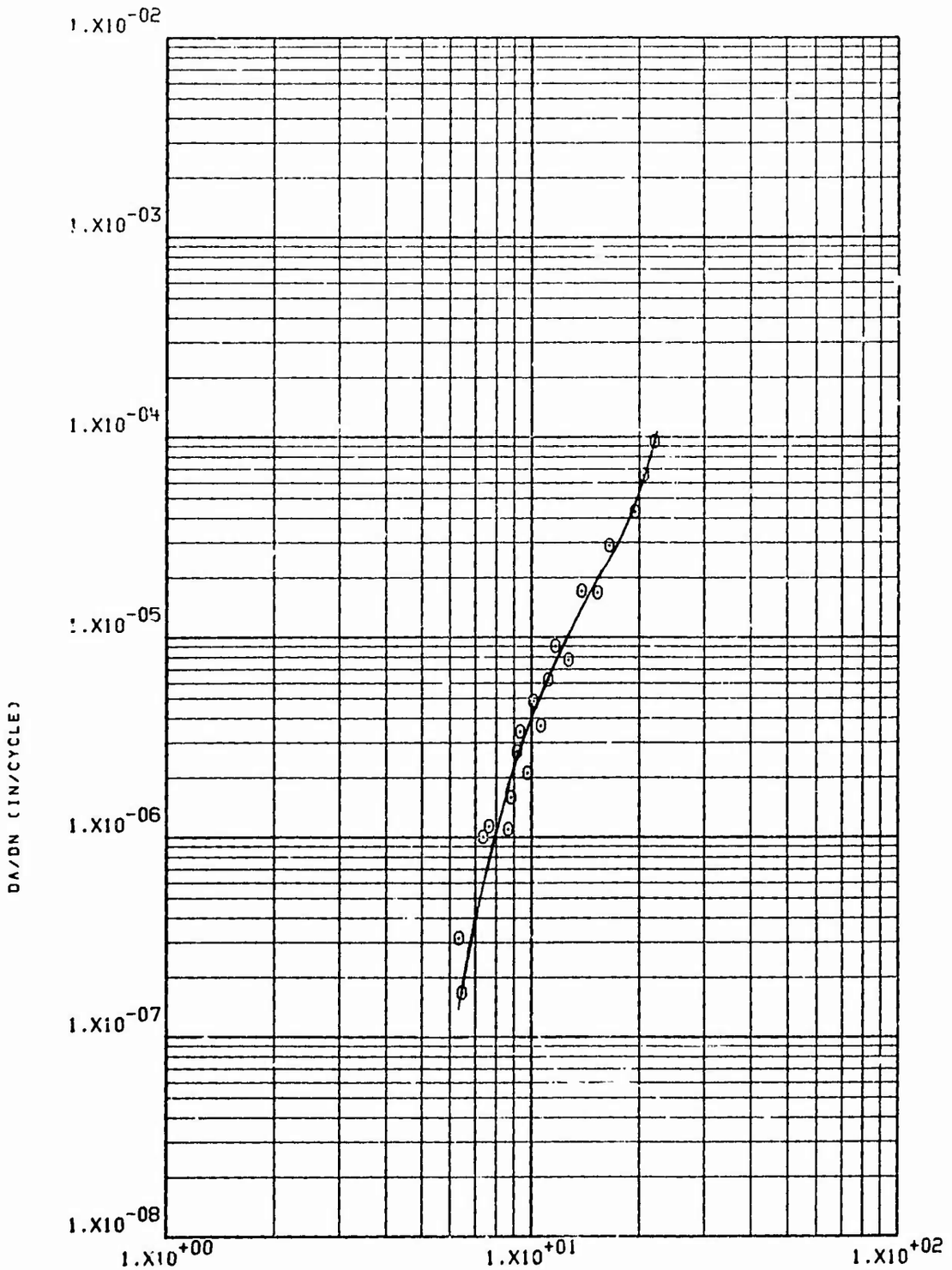
18 NWR 51-64 7075-T7351 SUMP R.T. 60CPM R=.08



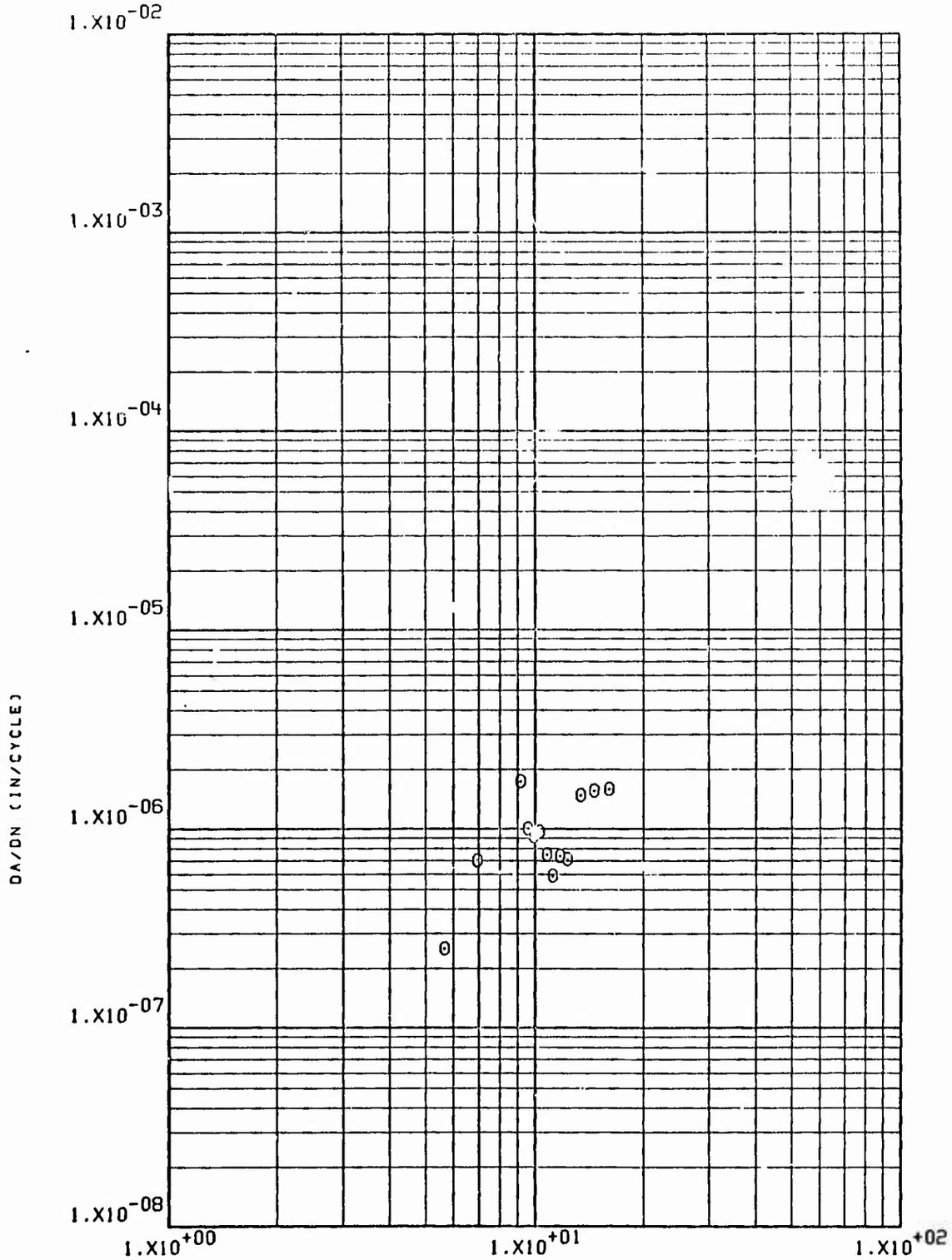
19 NRW 64-13 2024-T852 FORGING LHA RT R=.08 360CPM



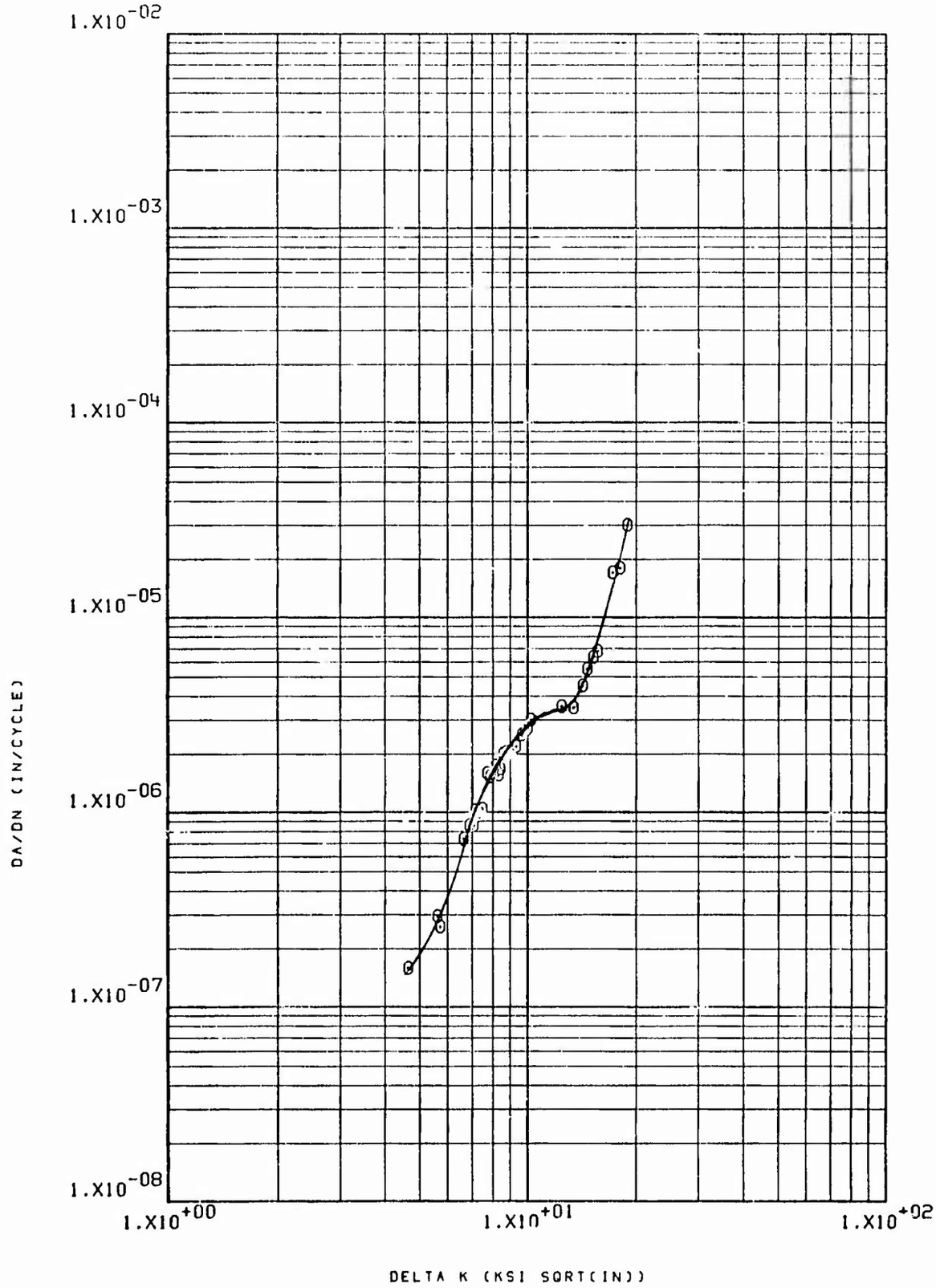
19 NRW 64-14 2024-T852 FORGING LLHA RT R=.08 60CPM



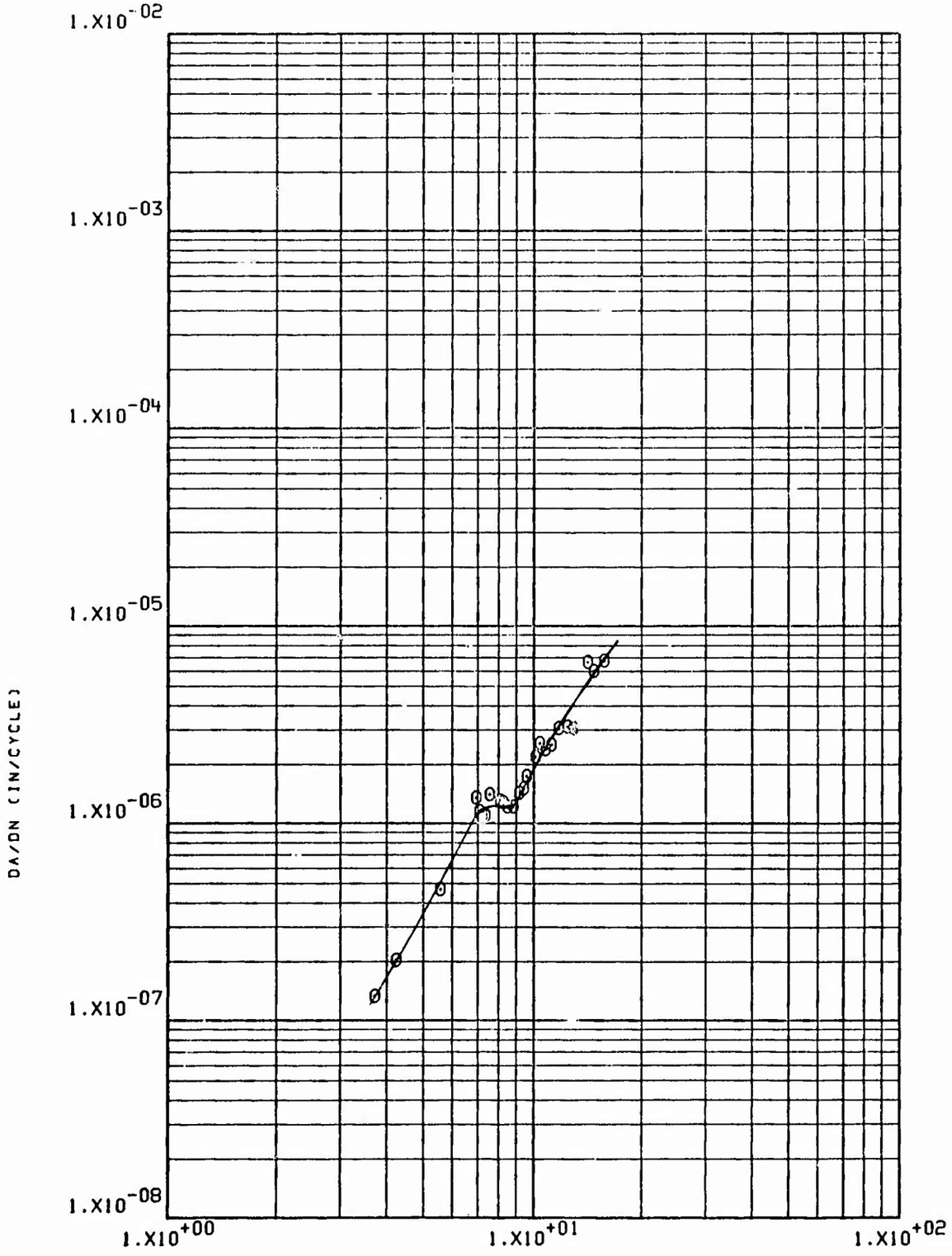
19 NRW 64-15 2024-T-852 HAND FORGING SUMP 60CPM R=.08 R.T.



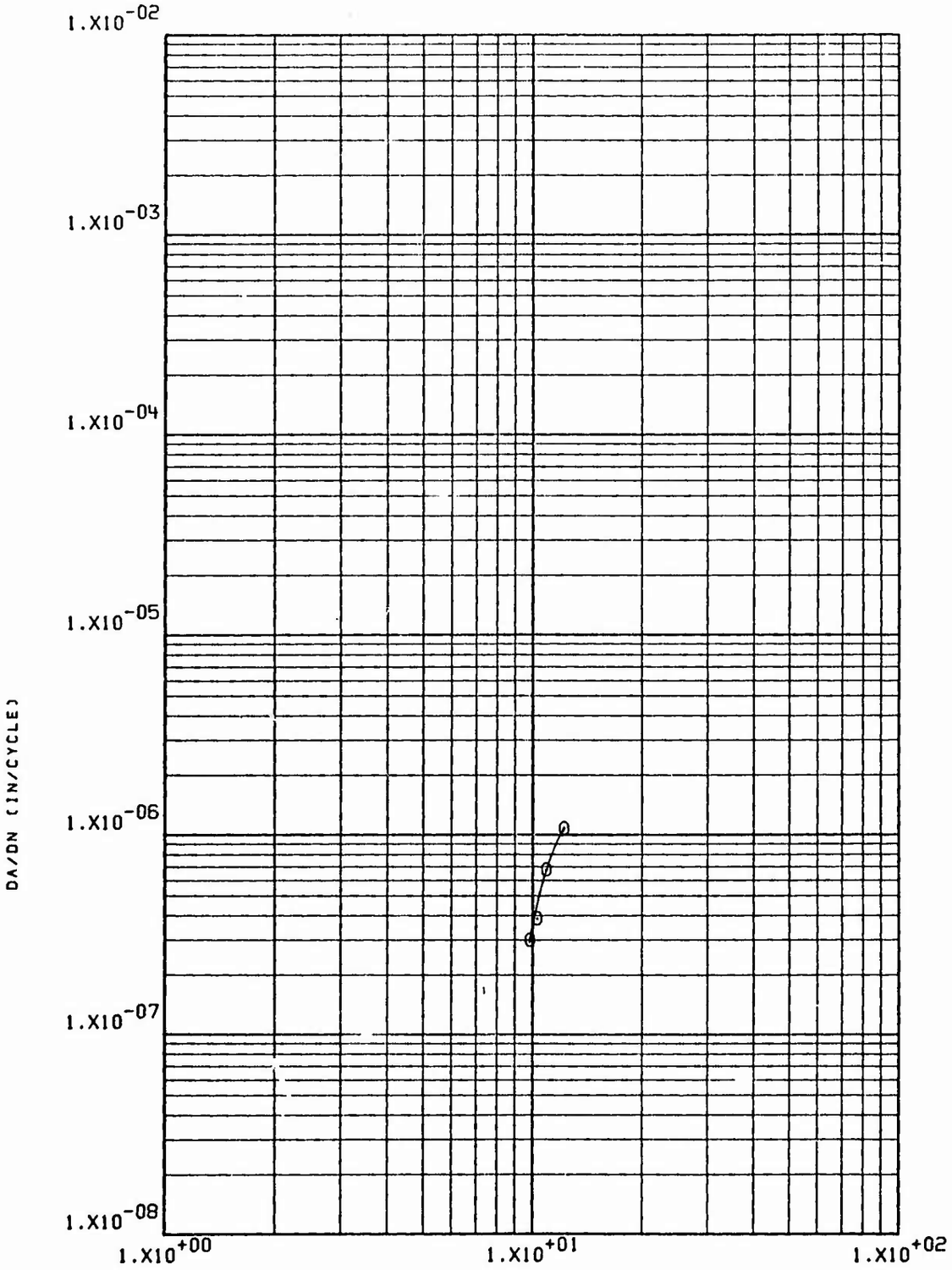
19 NRW 64-16 2024-T852 FORGING LHA RT R=.08 360CPM



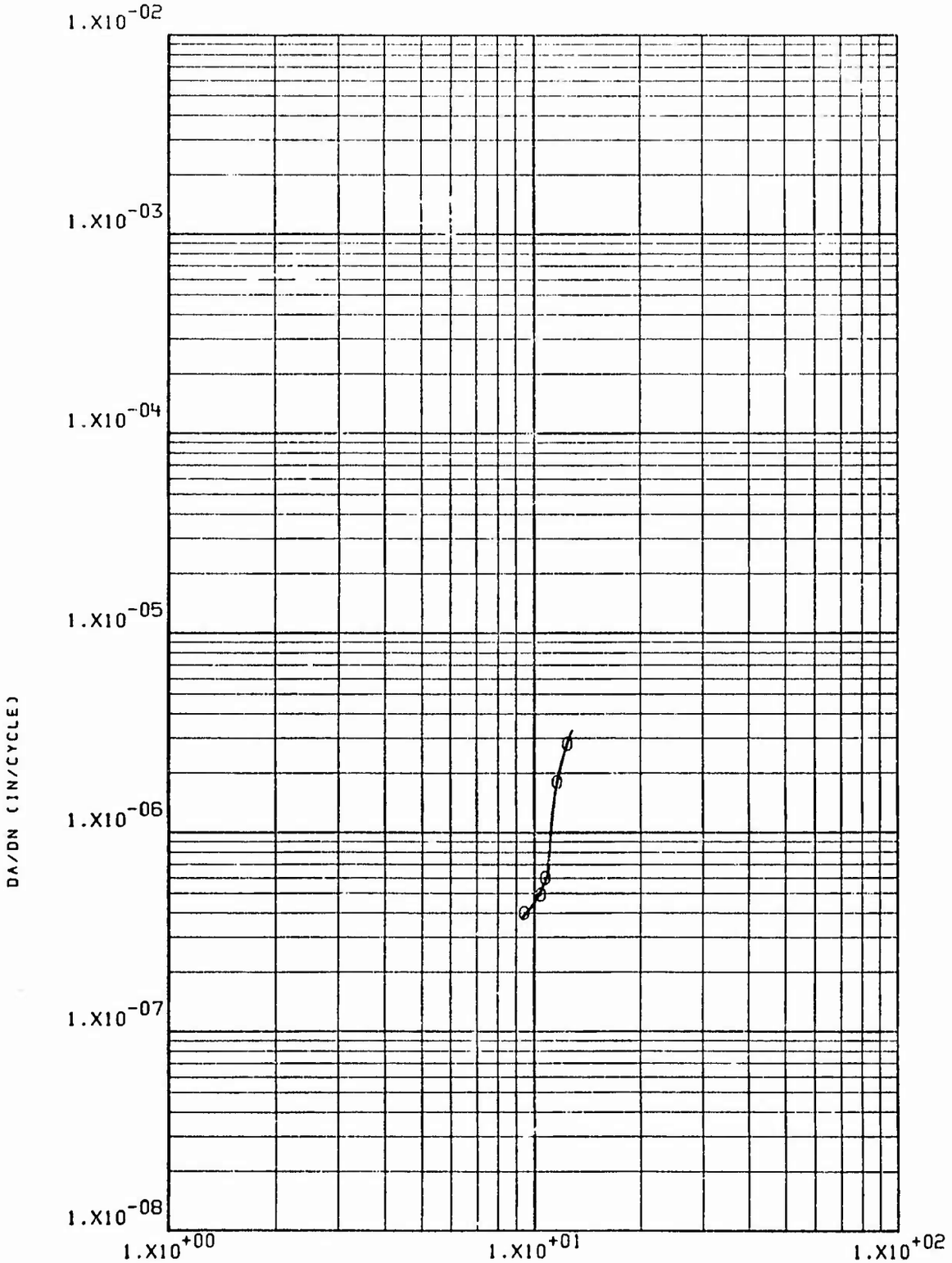
19NWR64-17 2024-T852 HAND FORG LHA RT 360CPM R=.08



20 NRW 65-1 2219-T852 FORGED BILLET LHA RT 360CPM R=.08

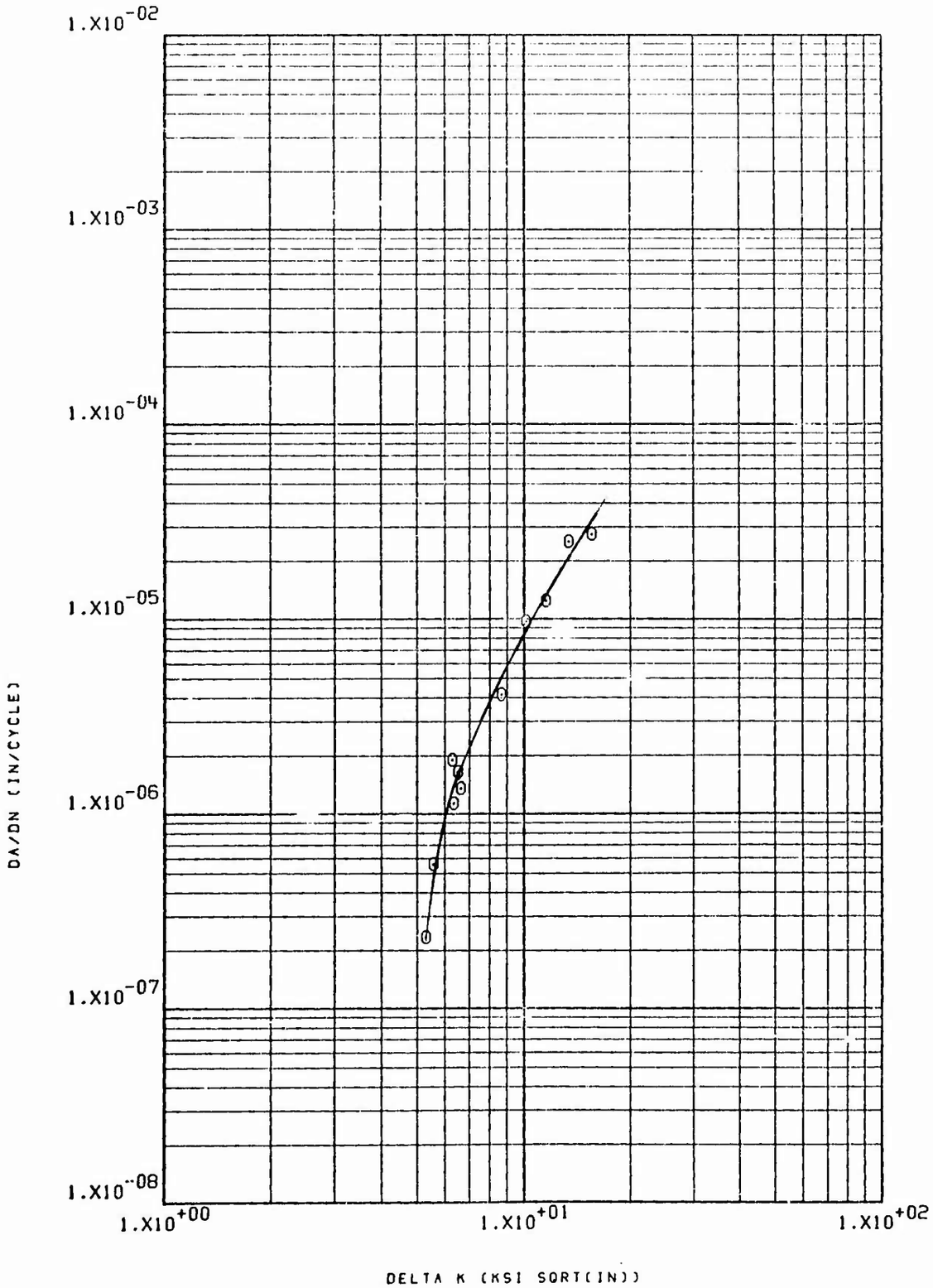


21 NRW 67-1 (7175-T736) LHA RT R=.08 360CPM

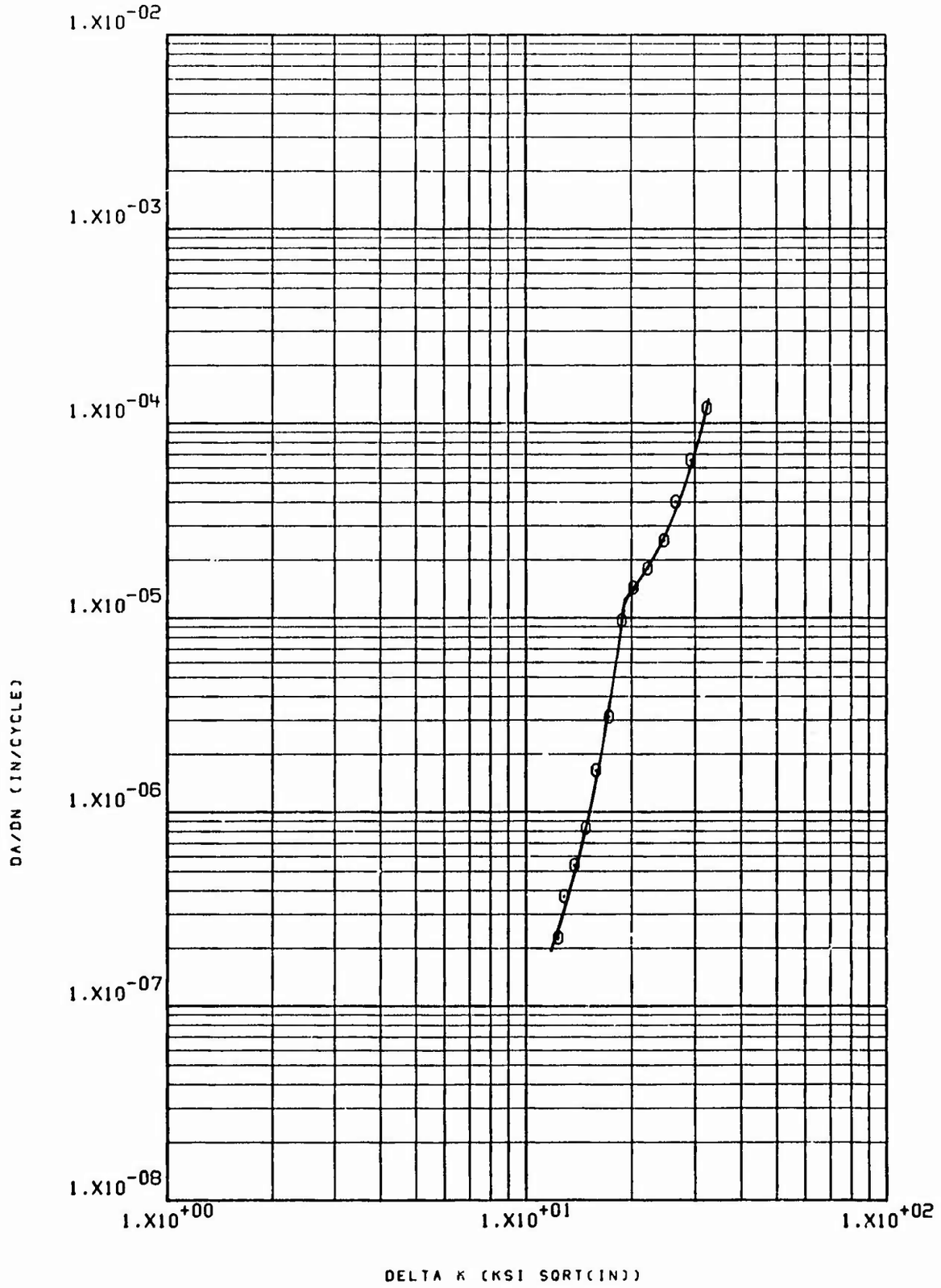


-T7352

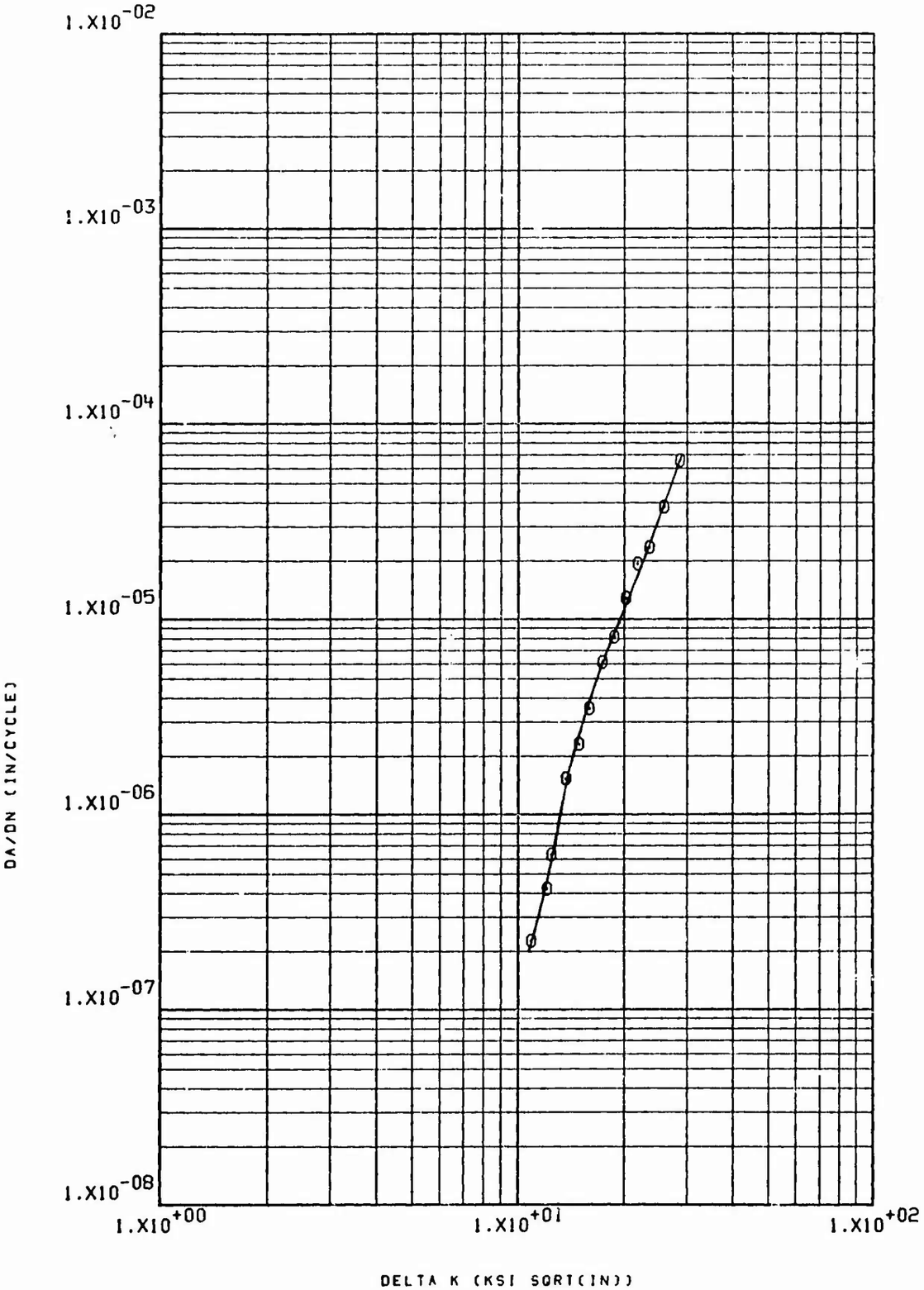
22 NRW 68-1 7075- LHA R.T. 360CPM R=.08



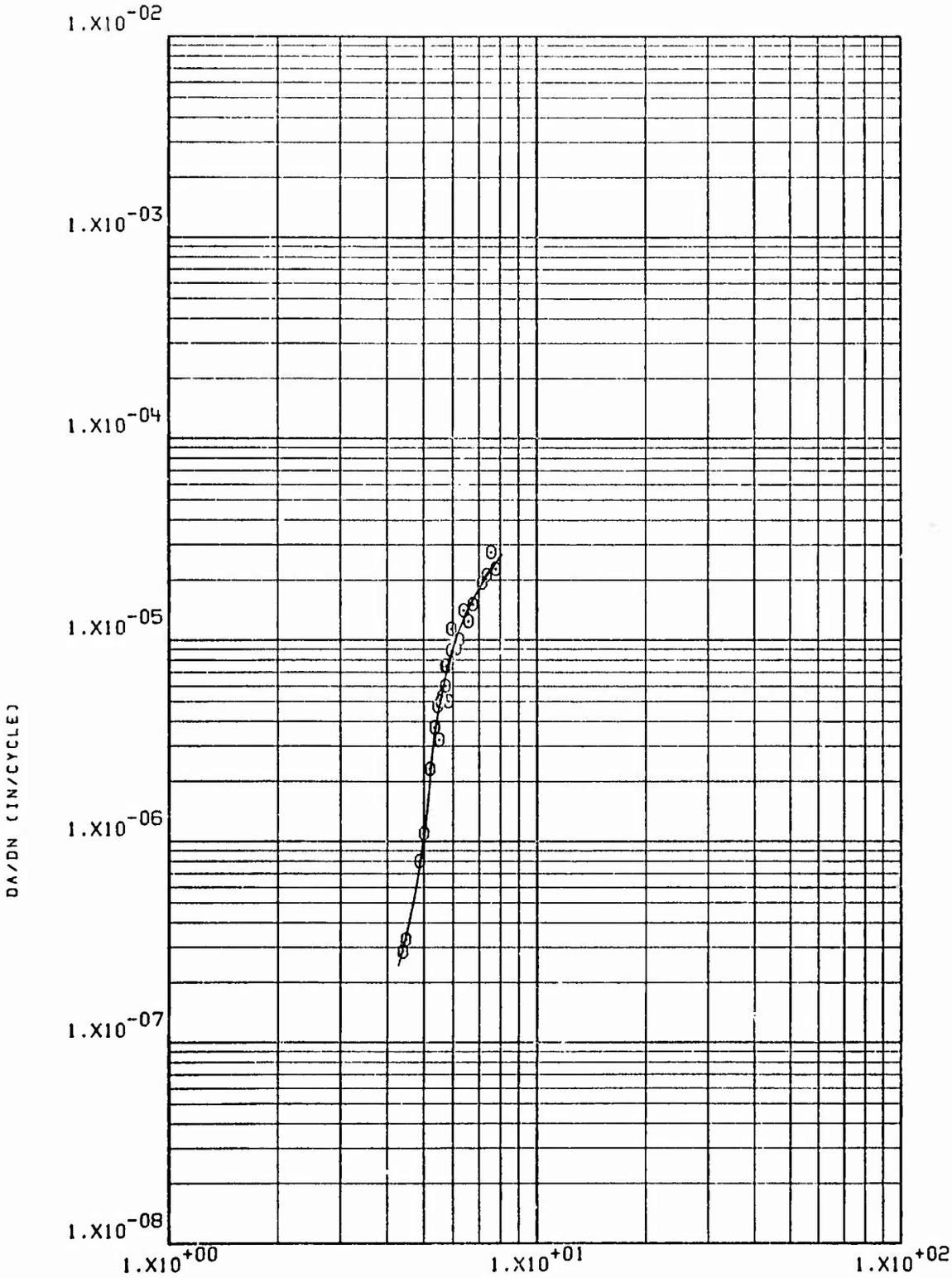
22 NRW 68-12 7075-T7352 LHA RT R=.08 360CPM



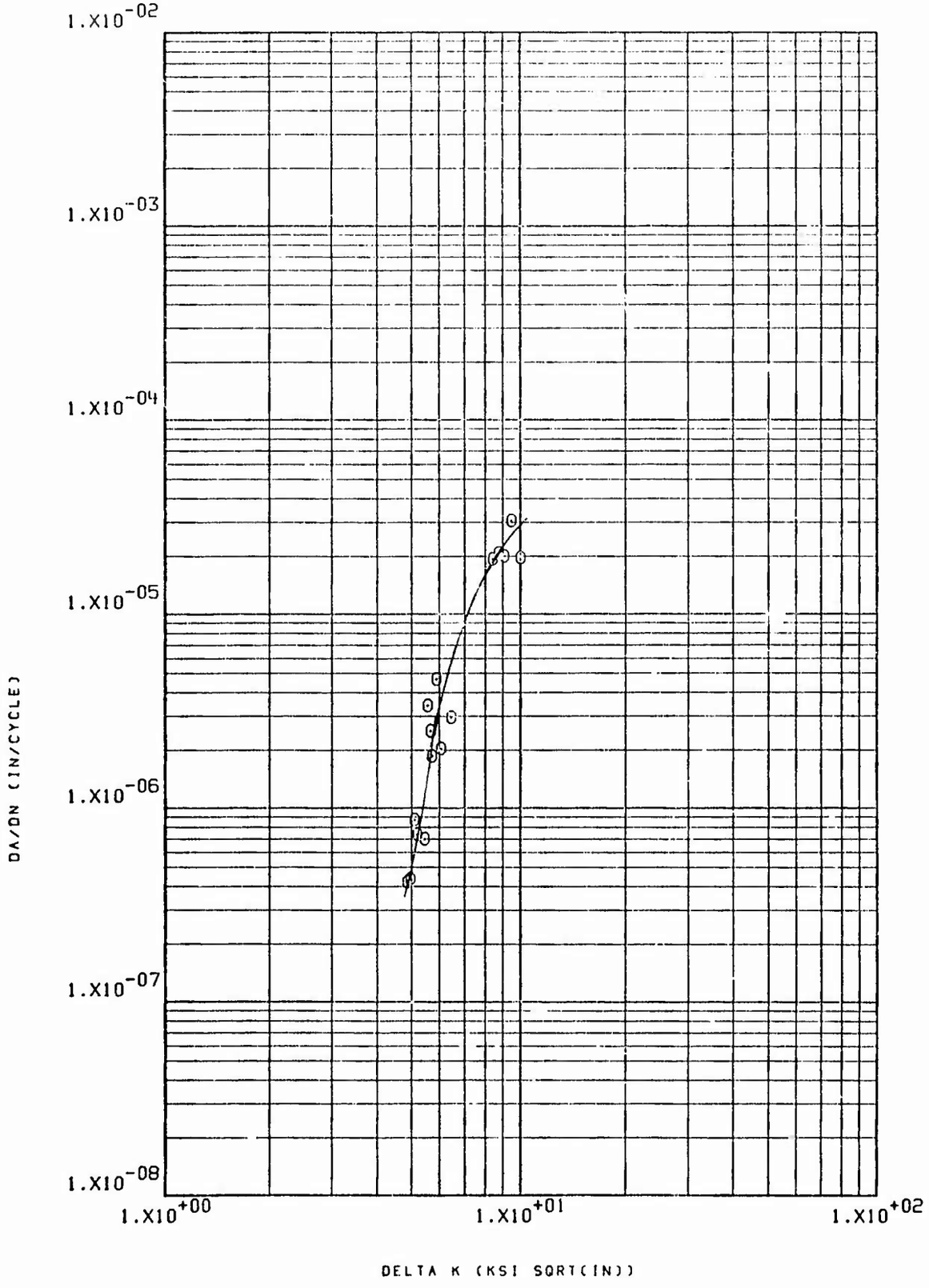
23 NRW 69-1 7050-T-73 FORGING LHA R.T. 360CPM R=.08



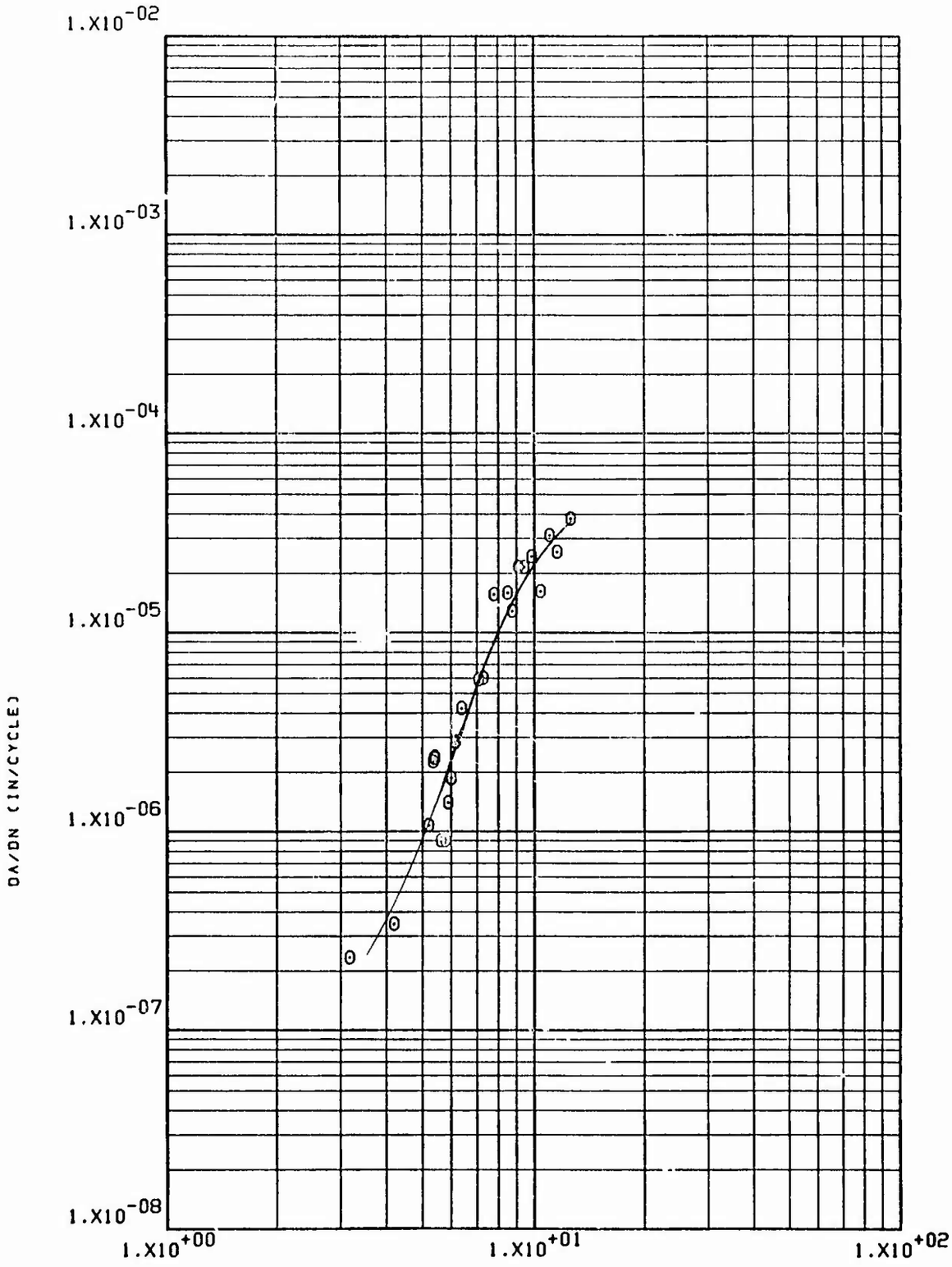
24 NRW 70-1 7049-T73 ALUM LHA RT R=.08 360CPM
(Br Mod.)



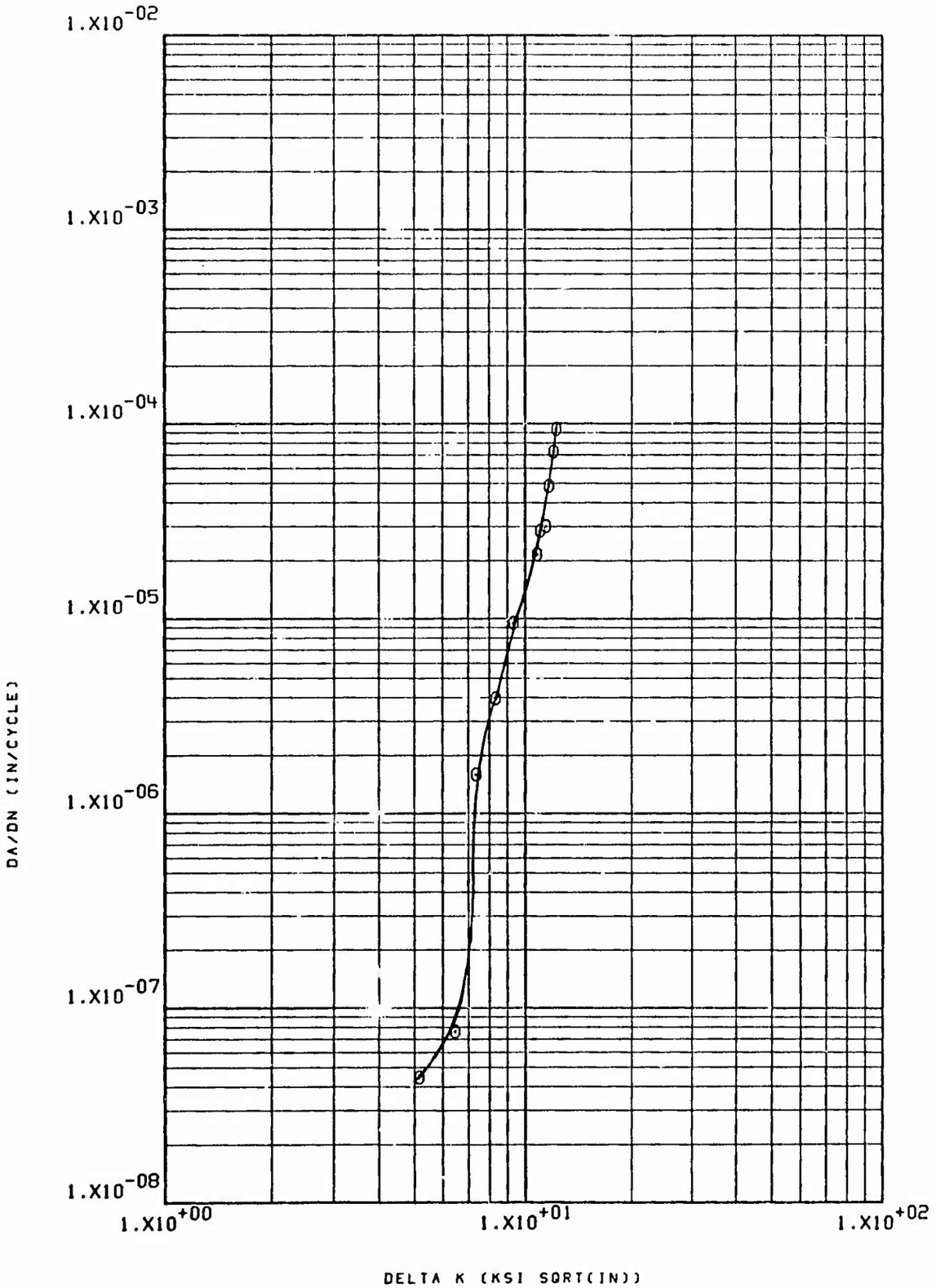
25 NRW 71-1 7049-T-7352 HAND FORGING SUMP R.T. 60CPM R=.5



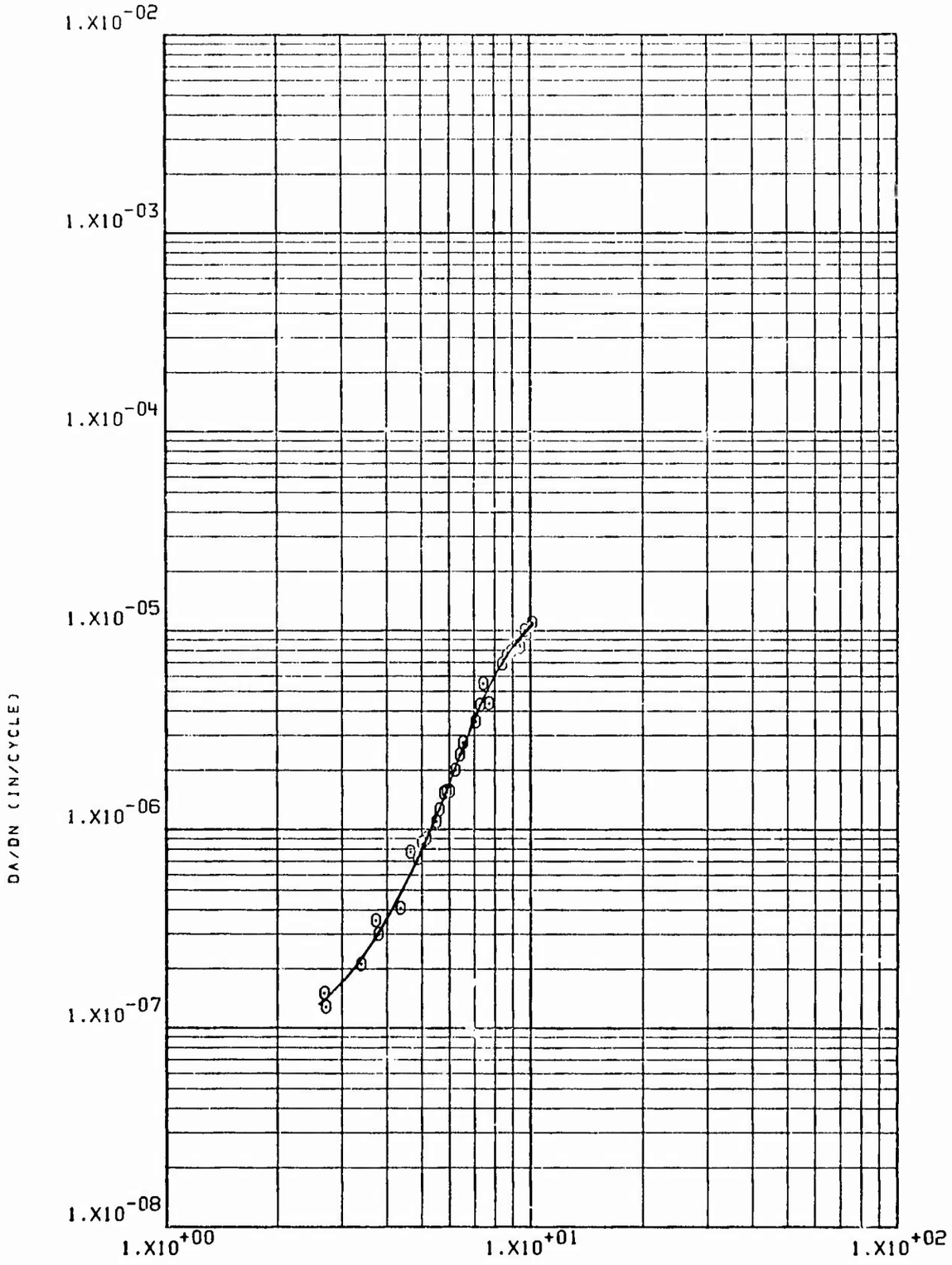
25 NRW 71-2 7049-T-7352 HAND FORGING SUMP R.T. 60CPM R=.3



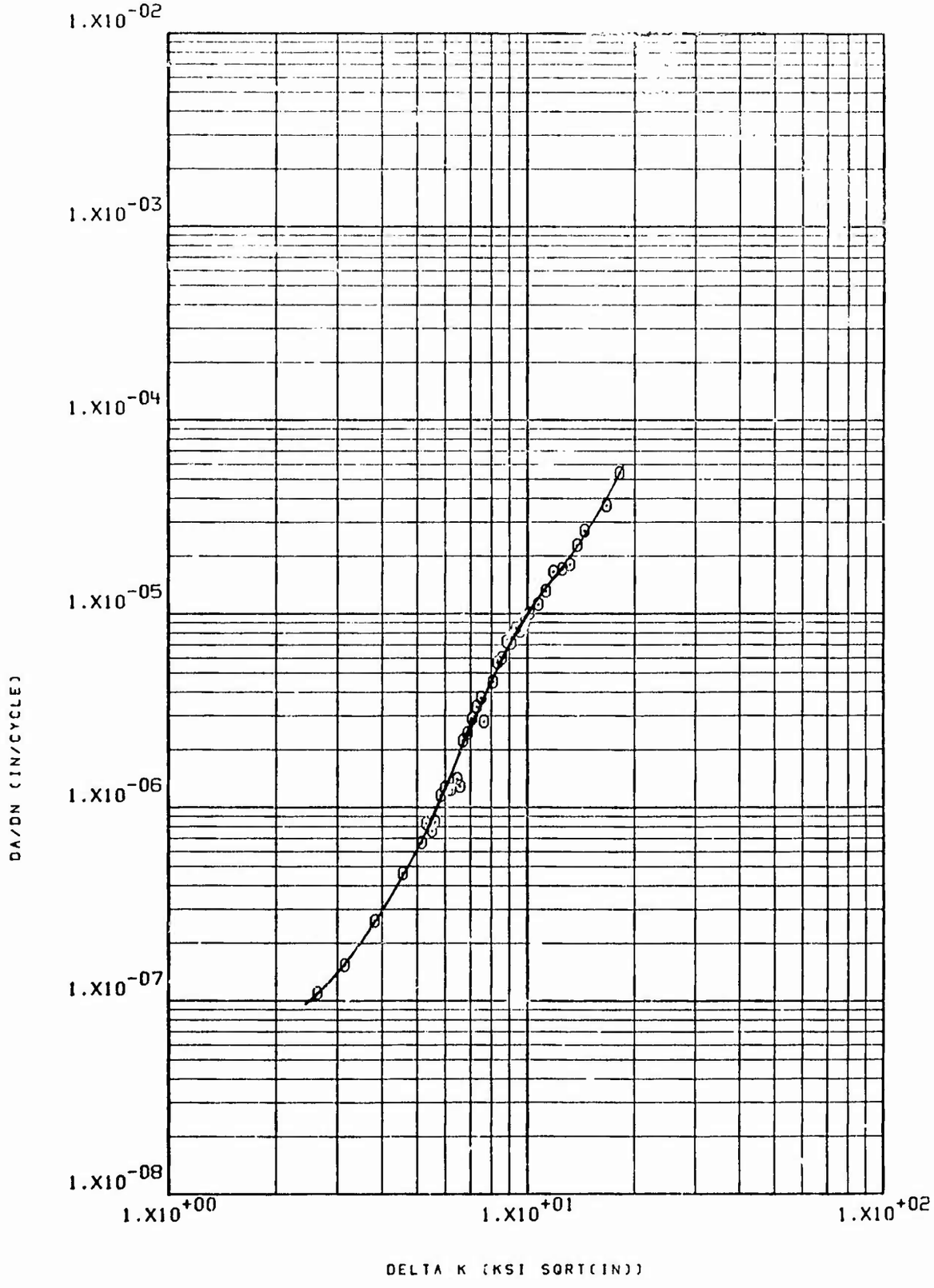
25 NRW 71-3 7049-T7352 STW RT R=.08 60 CPM



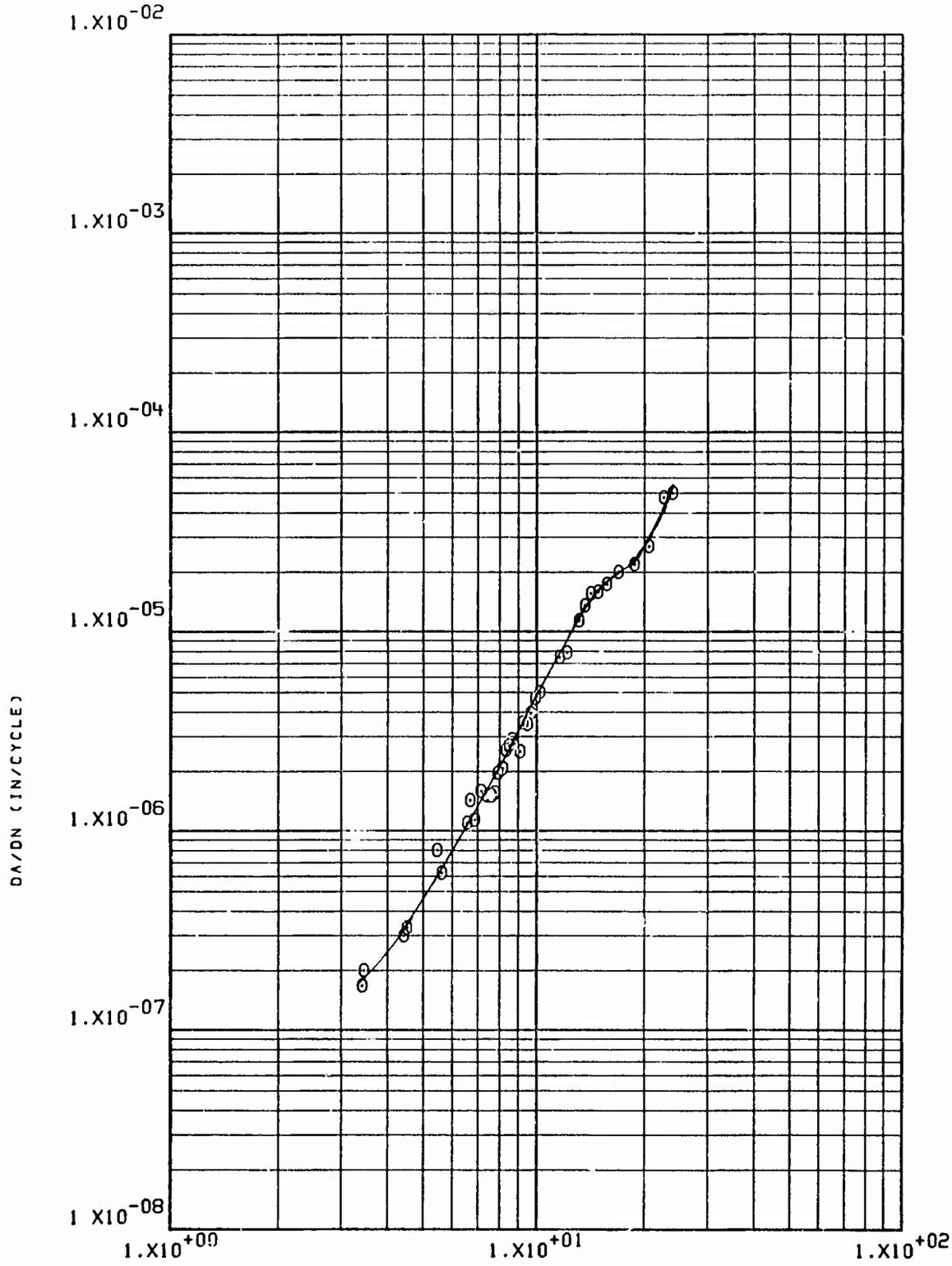
25 NRW 71-4 7049-T7352 FORG SUMP RT R=.08 6CPM



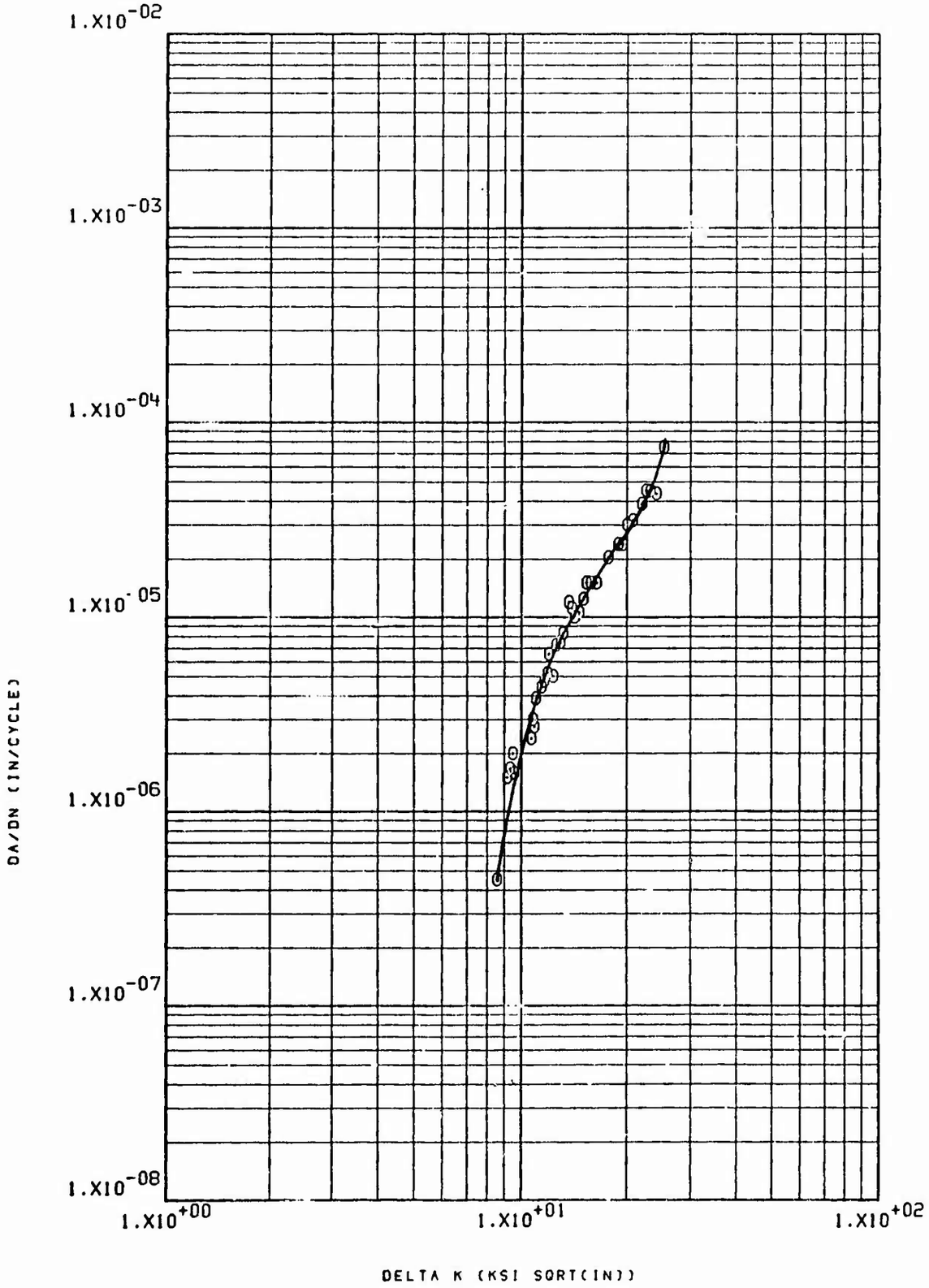
25 NRW 71-5 7049 T7352 HAND FORGING RT LHA 360CPM R=.5



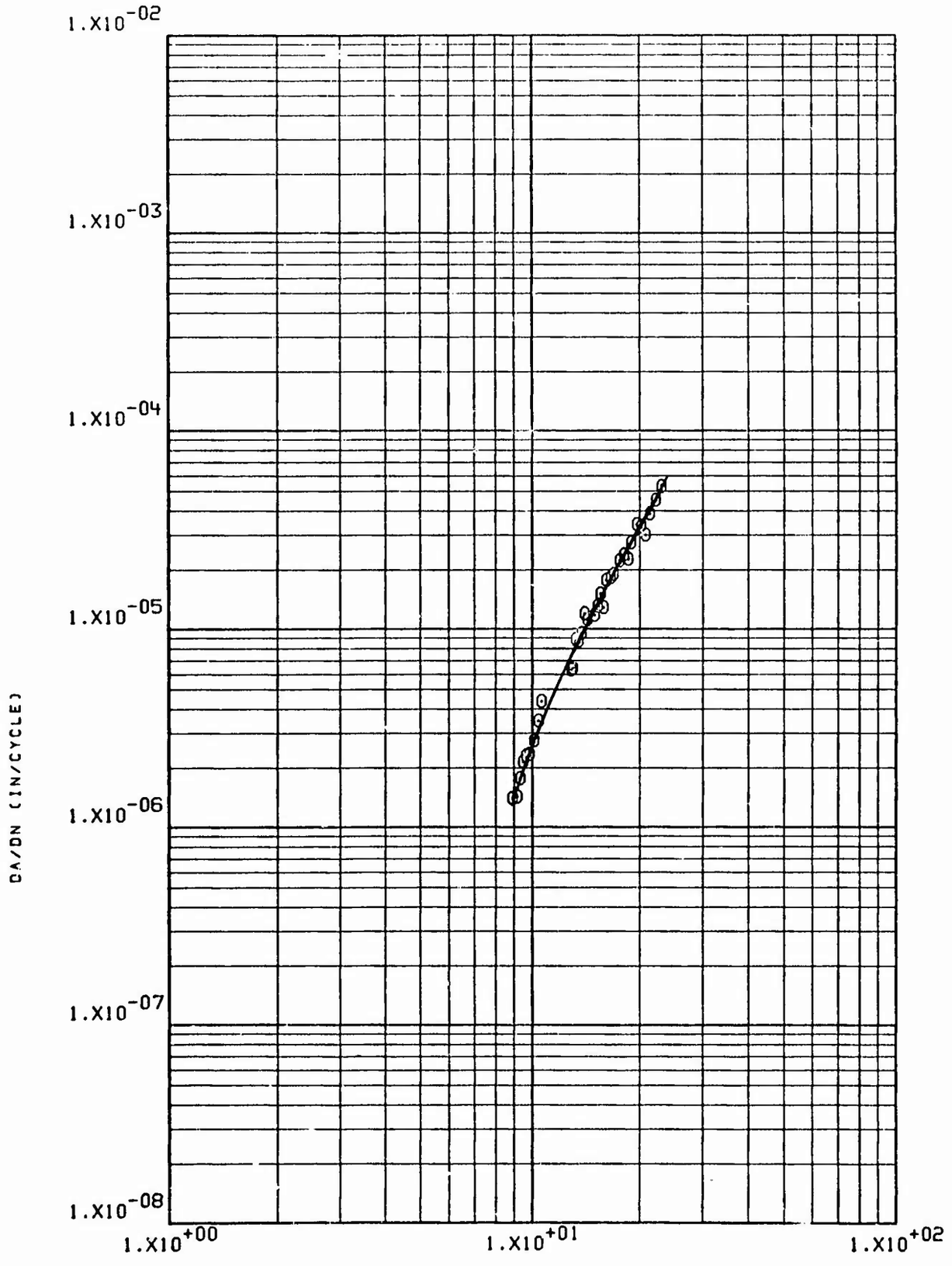
25 NRW 71-6 7049-T7352 HAND FORGING RT LHA 360CPM R=.3



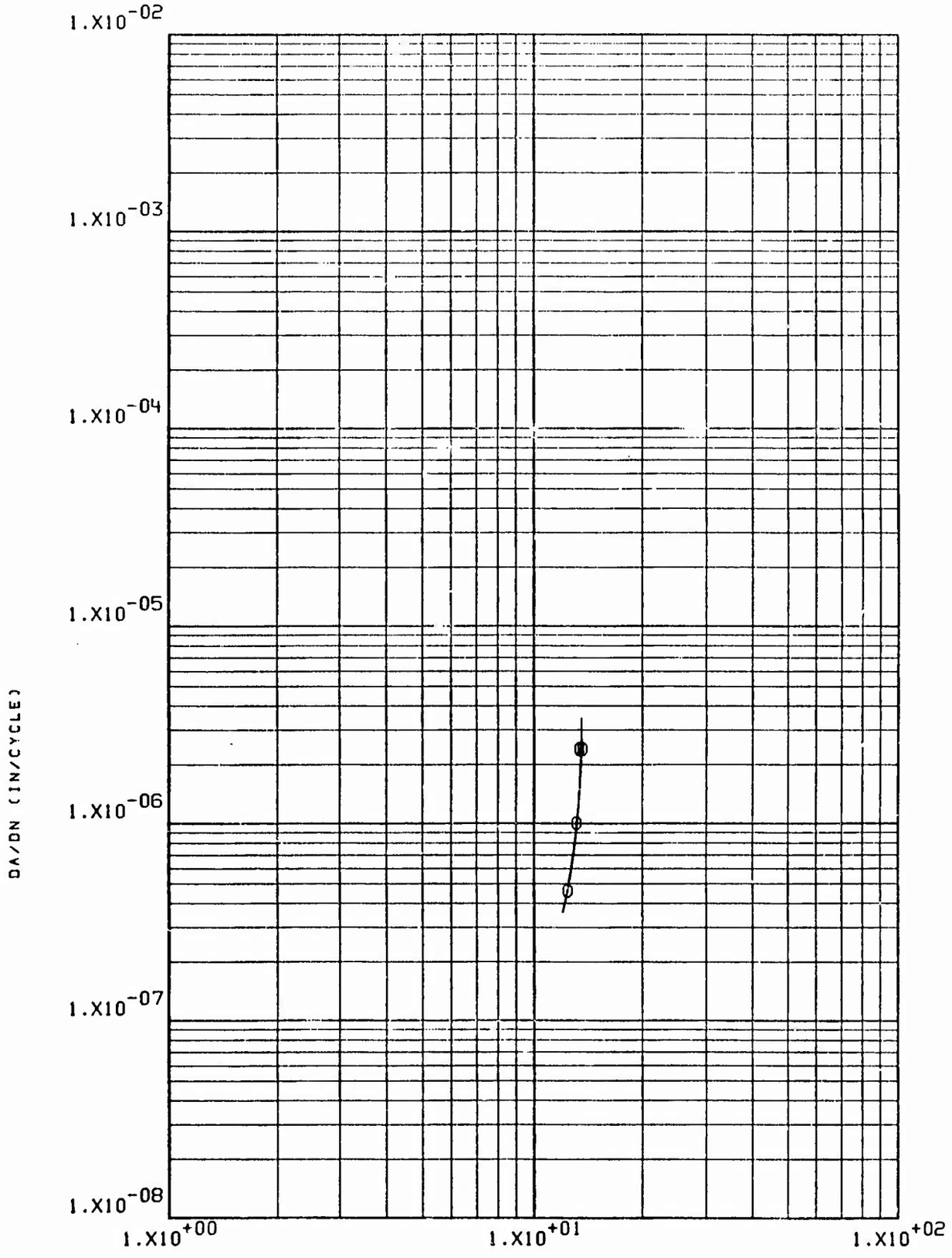
25 NRW 71-7 7049-T-7352 HAND FORGING LHA 360CPM RT R=.08



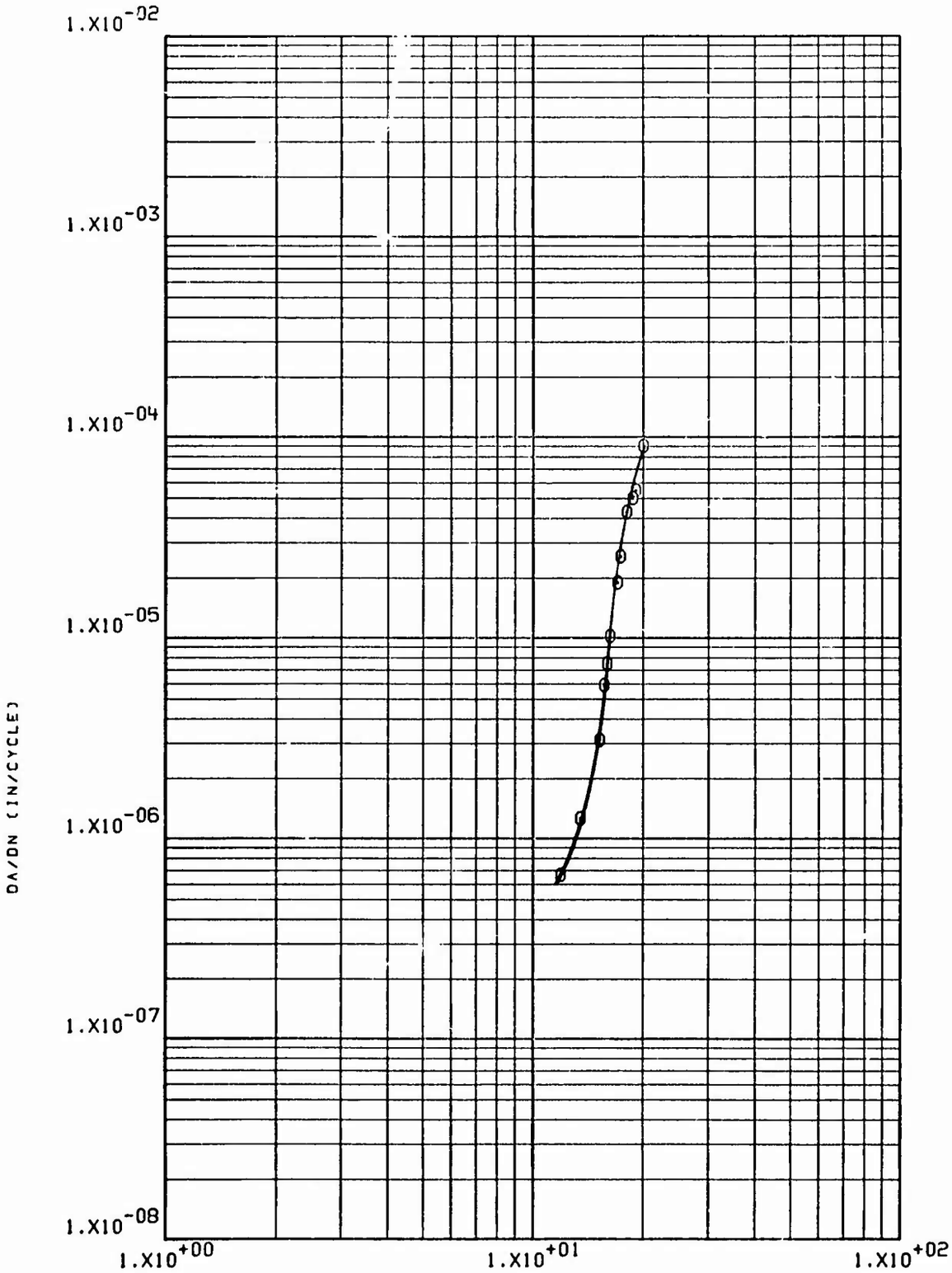
25 NRW 71-9 7049-T7352 FORG LHA RT R=.08 360CPM



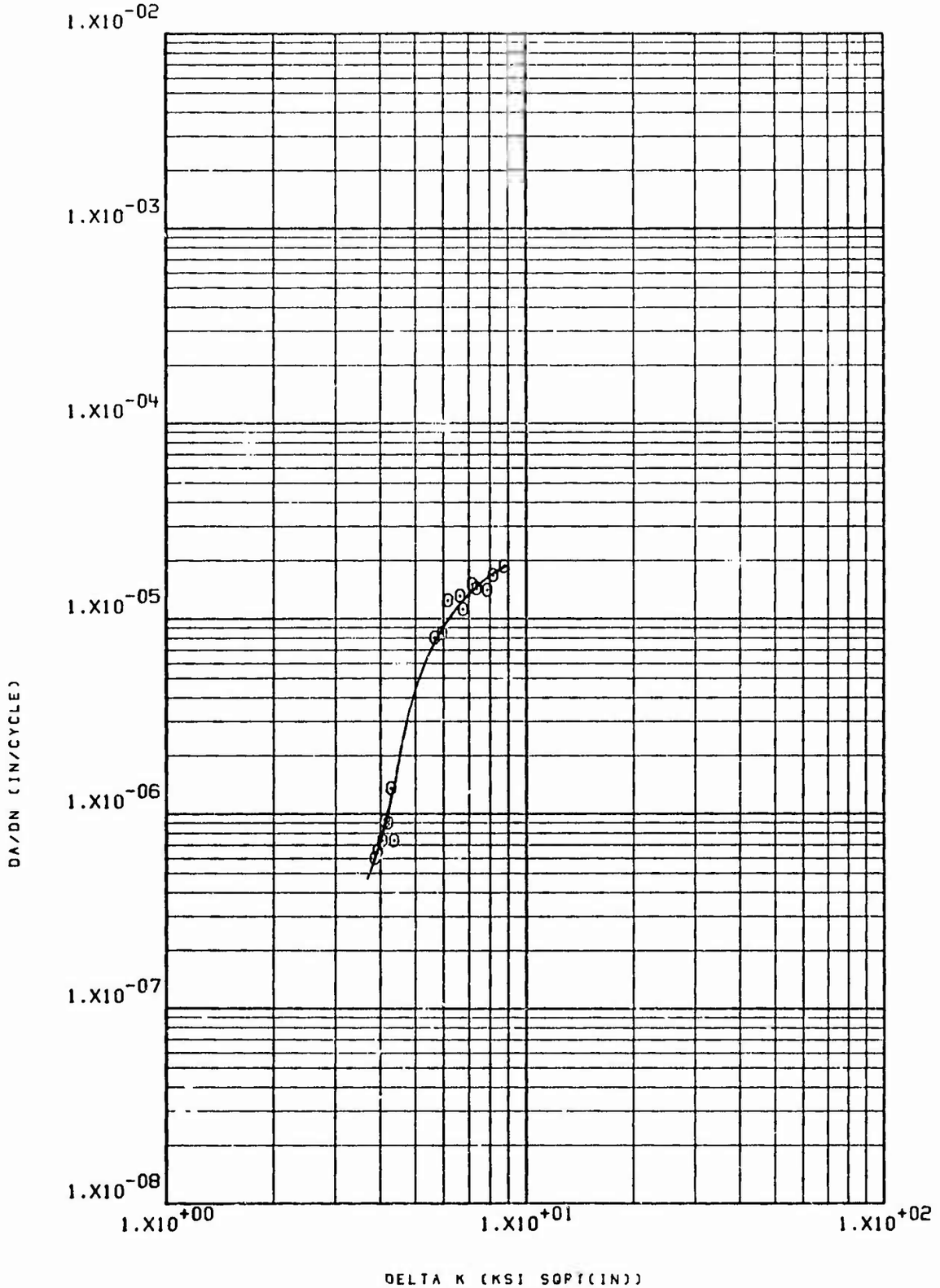
25 NRW 71-10 7049-T7352 LHA RT R=.08 360CPM



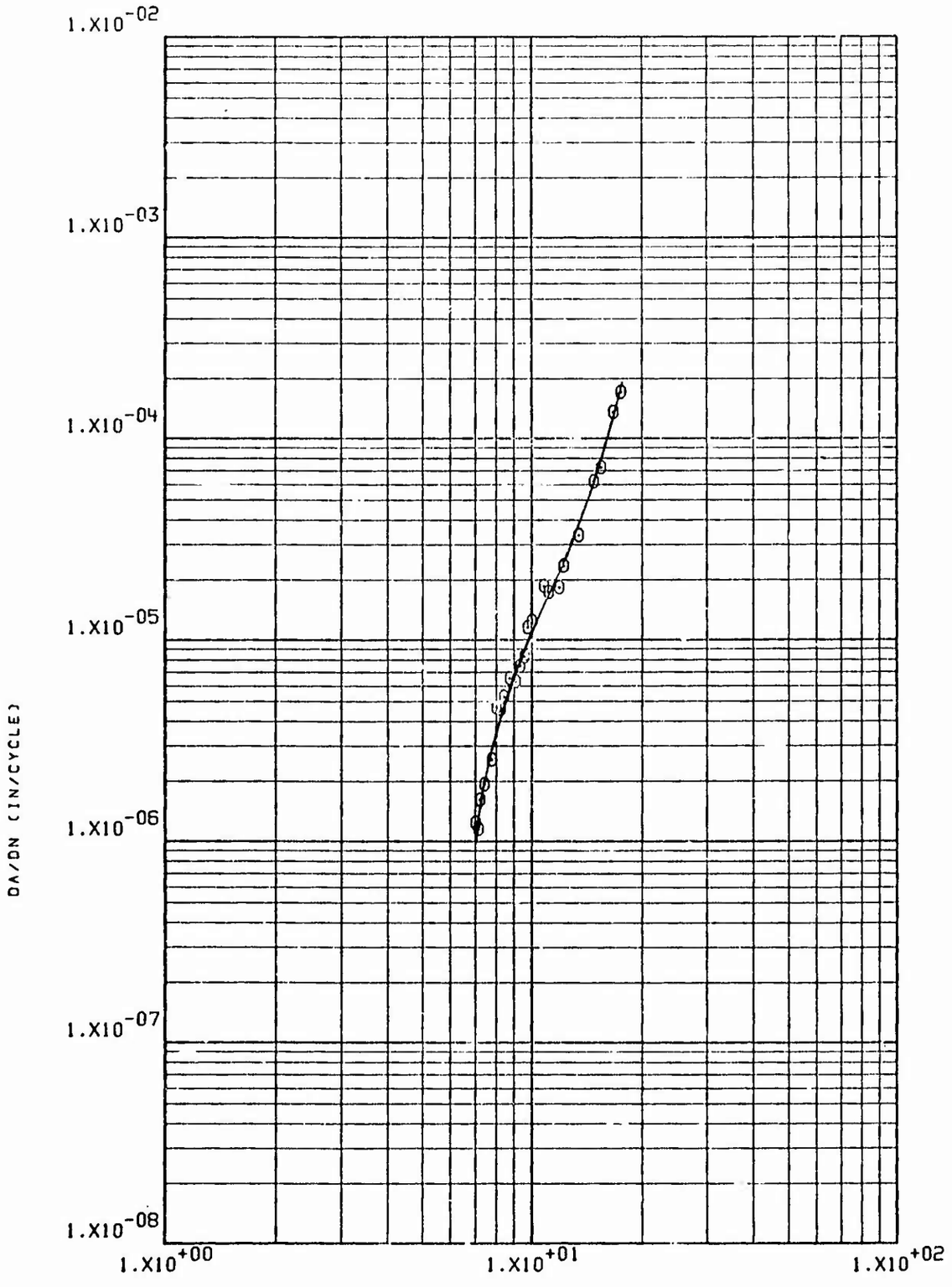
25 NWR 71-11 7049-T-7352 HAND FORGING SUMP R.T. R=.08 60CPM



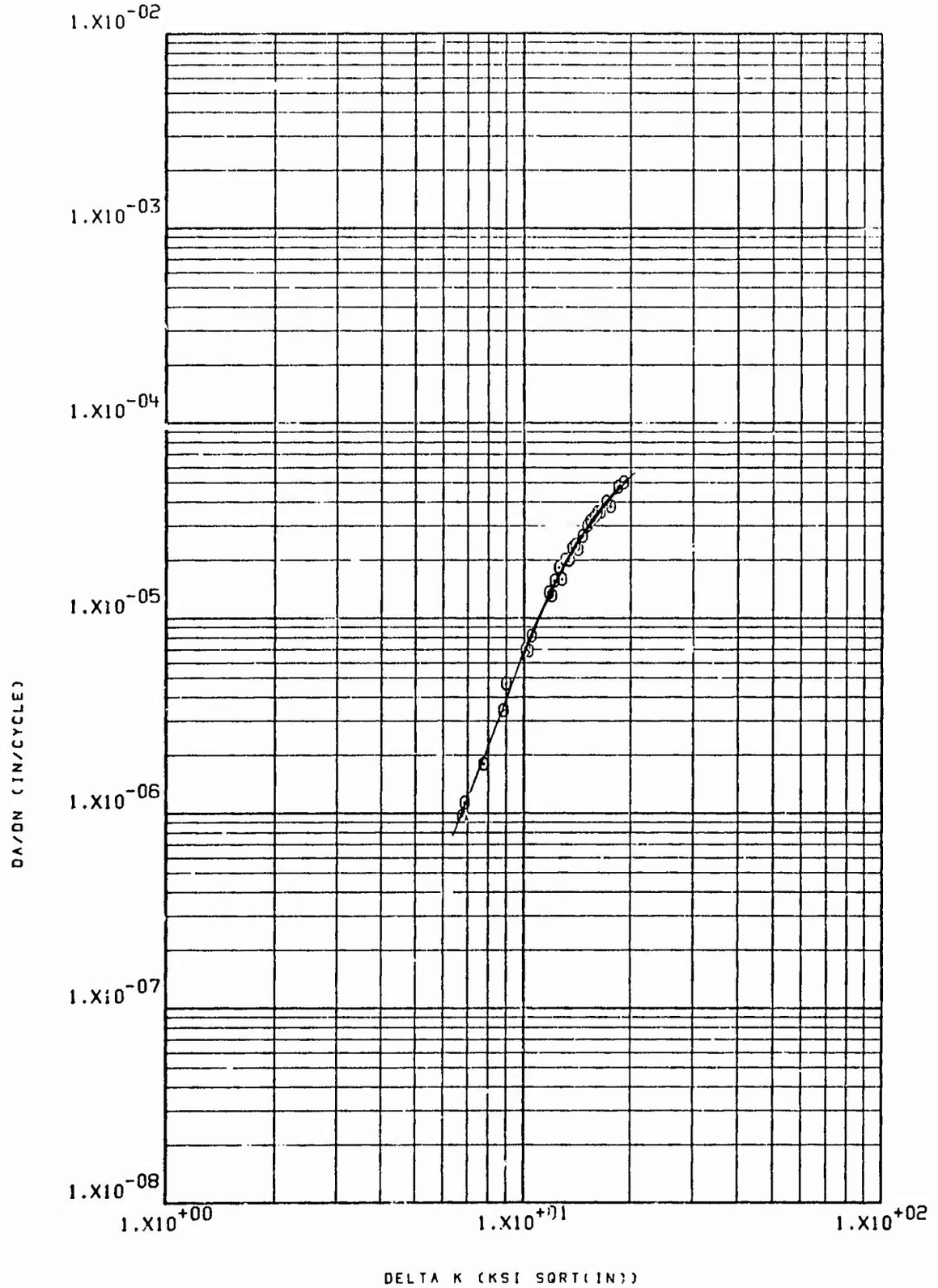
25 NWR 71-12 7049-T7352 ALUM LHA RT R=.08 360CPM



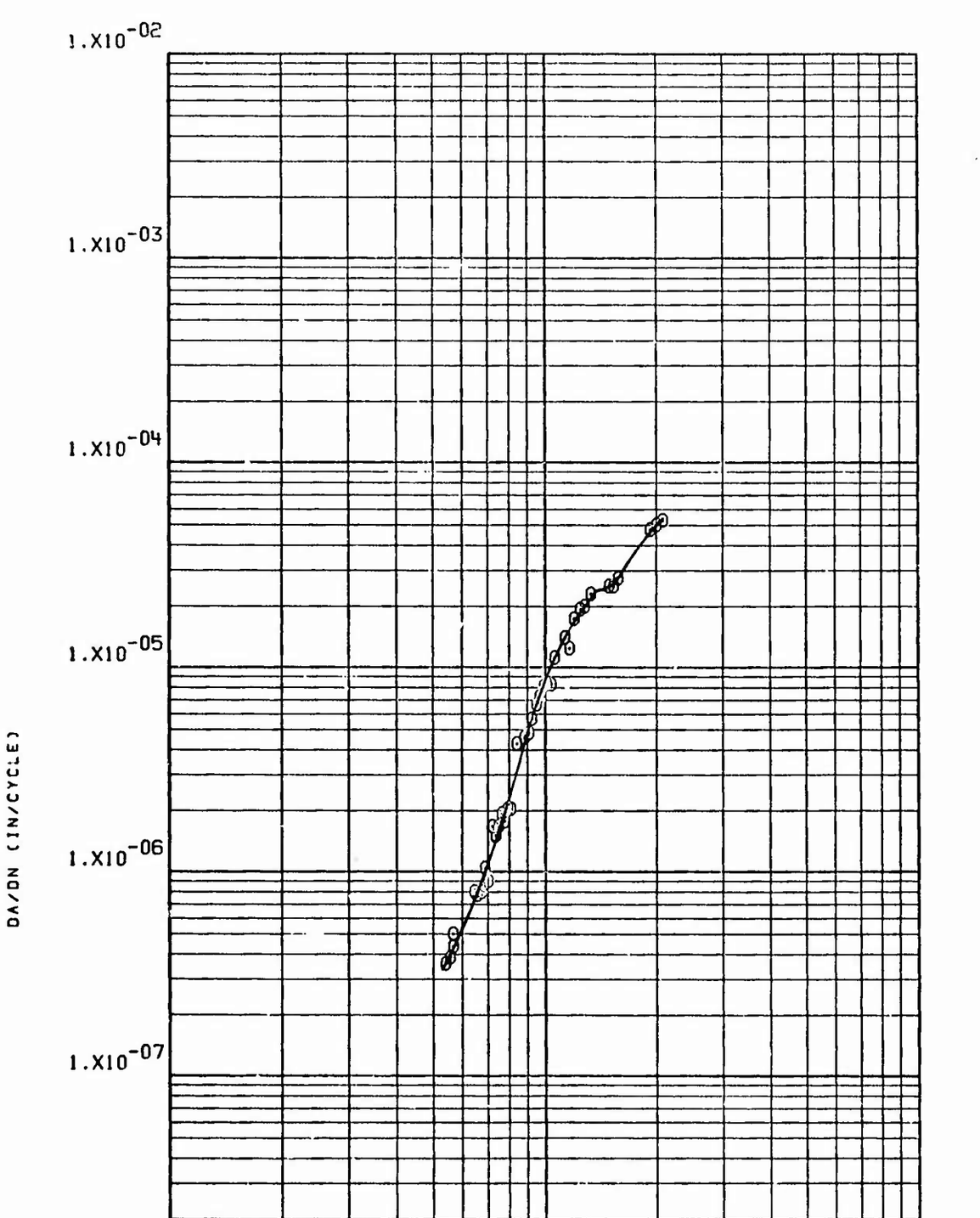
25 NRW 71-43 7049-T7352 STW RT R=.3 60CPM



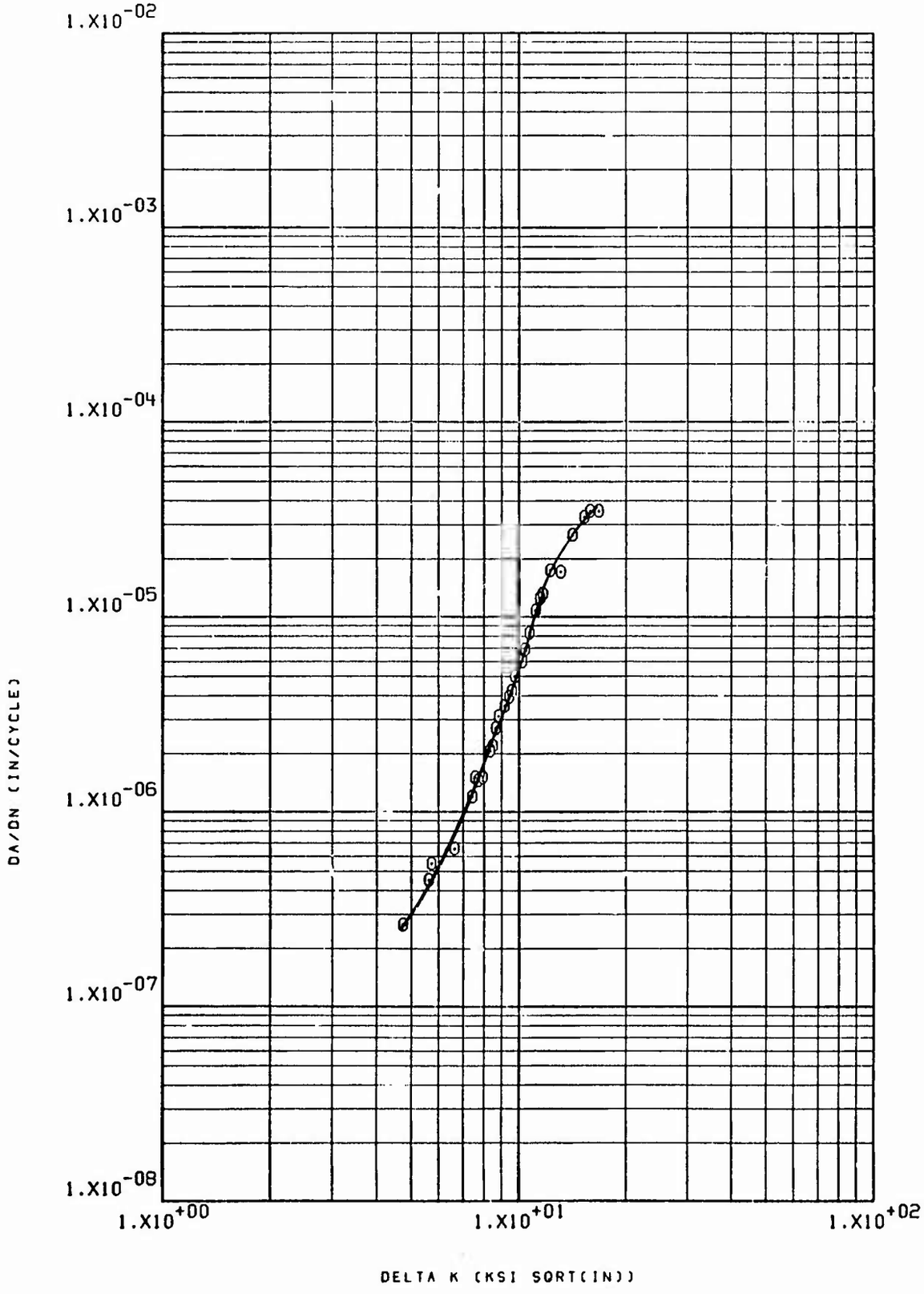
25 NWR 71-44 7049-T7352 STW RT R=.08 60CPM



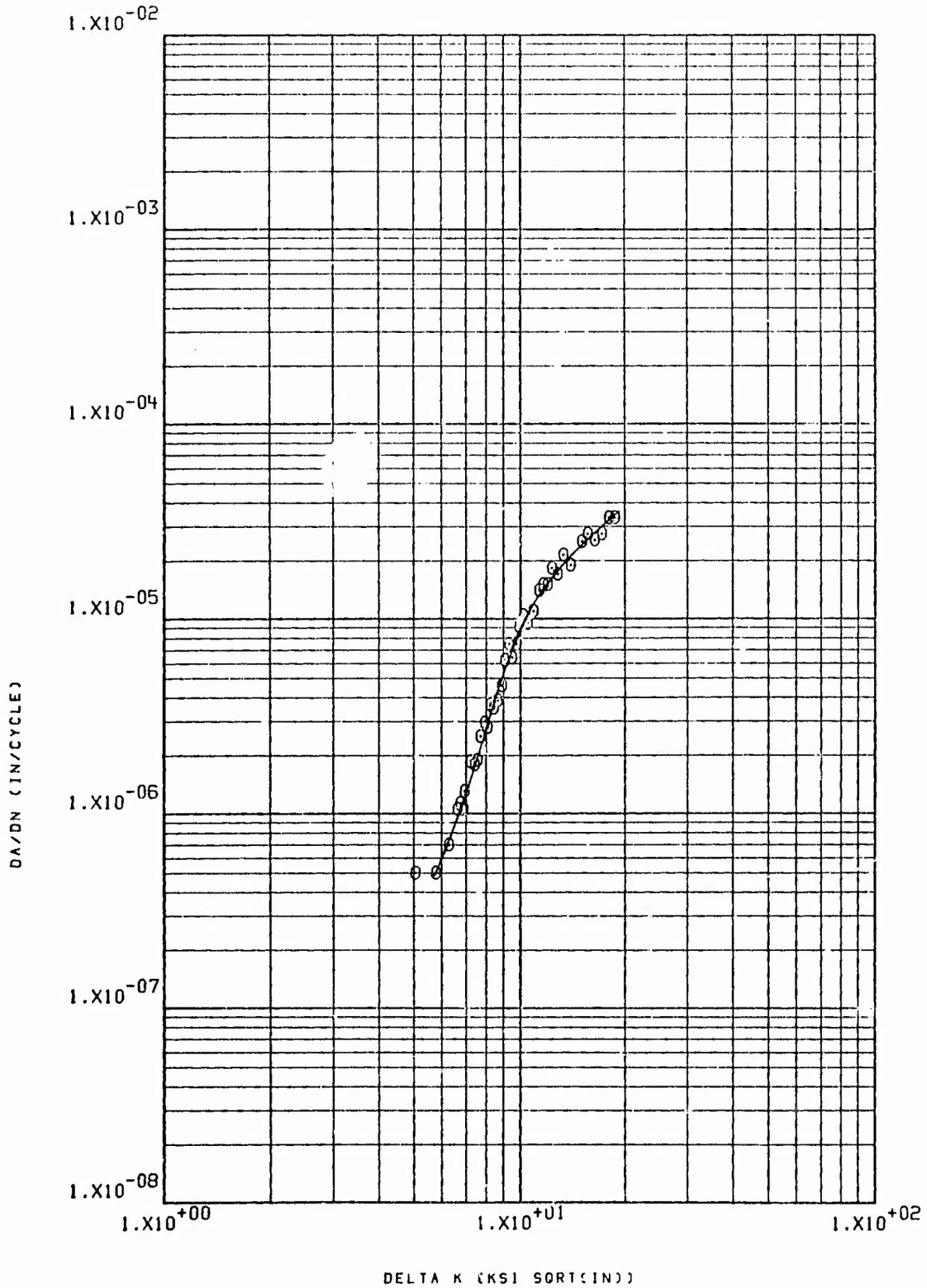
26 NRW 72-27 7175-T73652 LHA RT R=.08 6CPM



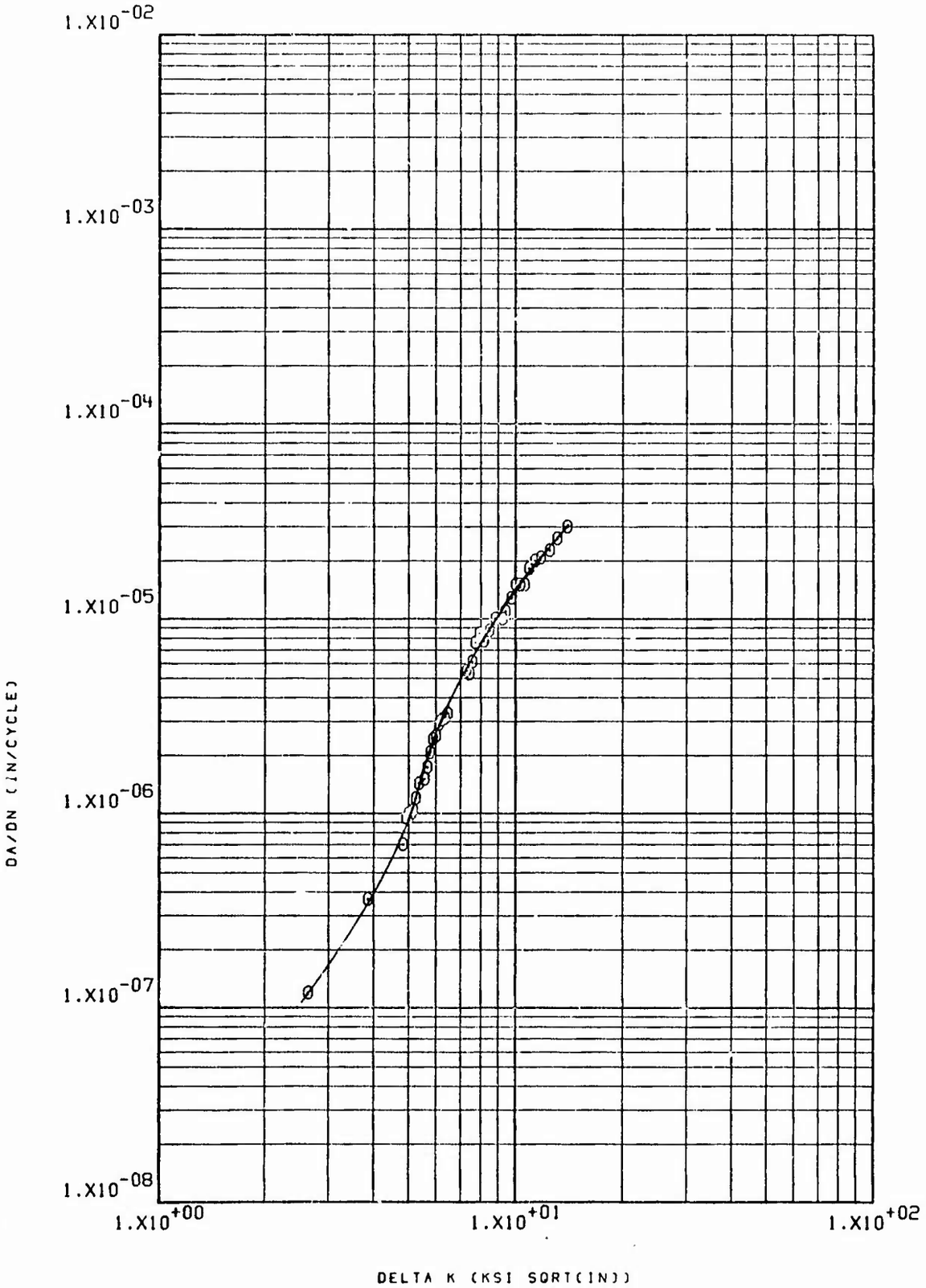
26 NRW 72-28 7175-T73652 (HAND FORGING) LHA RT R=.08 CPM=60



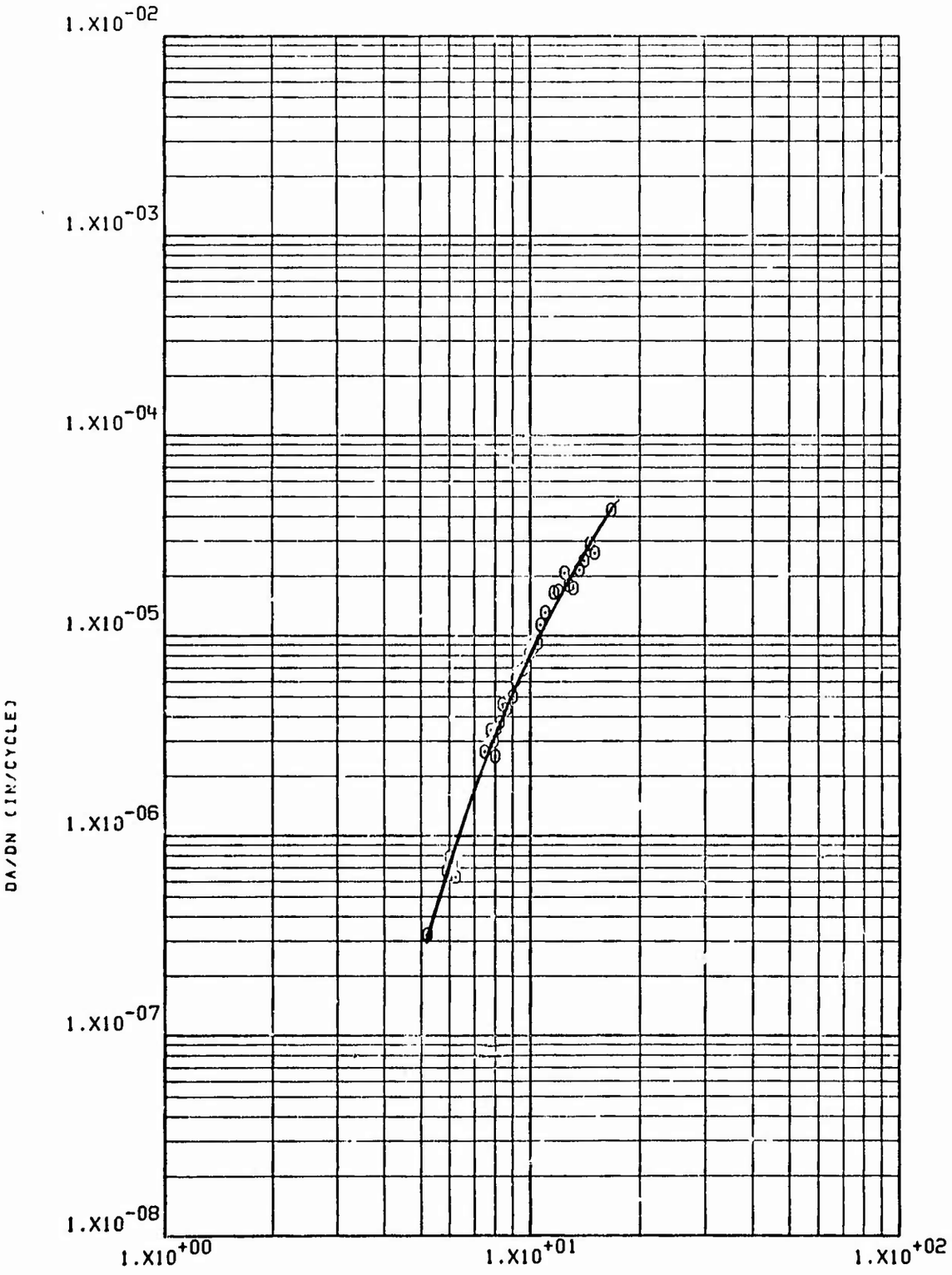
26 NRW 72-29 7175-T73652 FORGING LHA RT R=.08 360CPM



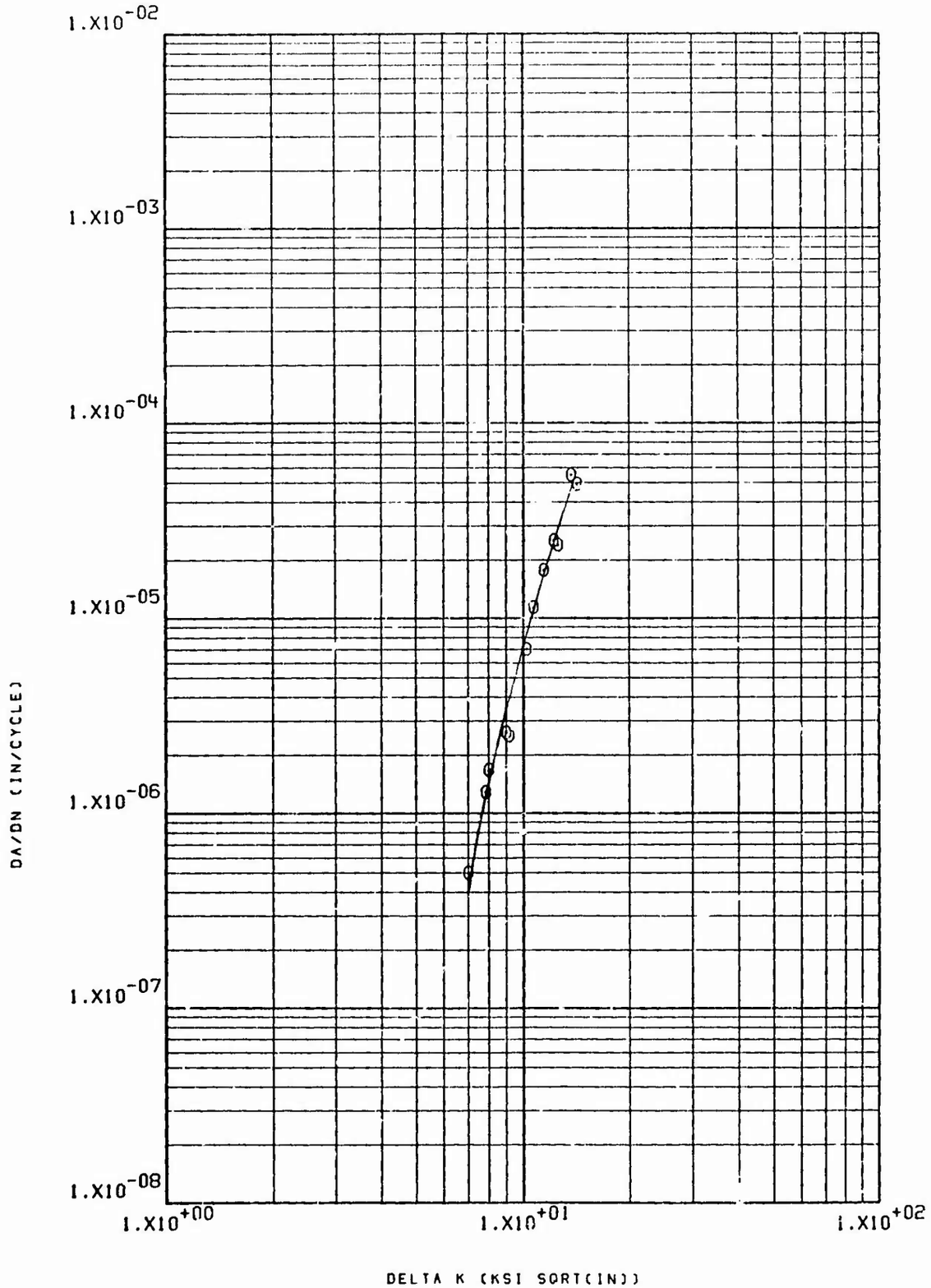
26 NRW 72-30 7175-T73652 FORGING LHA RT R=.3 360CPM



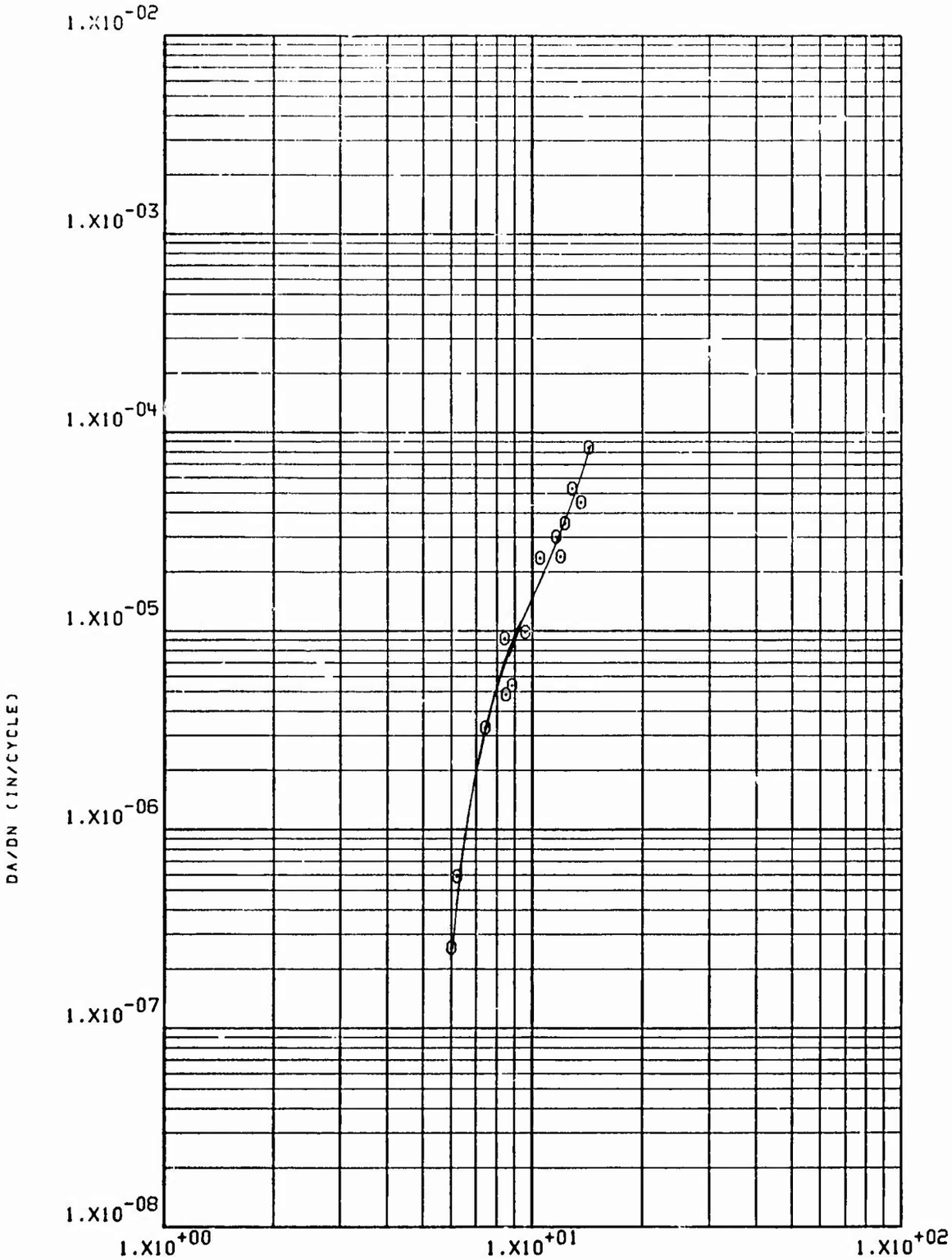
26 NRW 72-31 7175-T73652 FORGIN LHA RT R=.5 360CPM



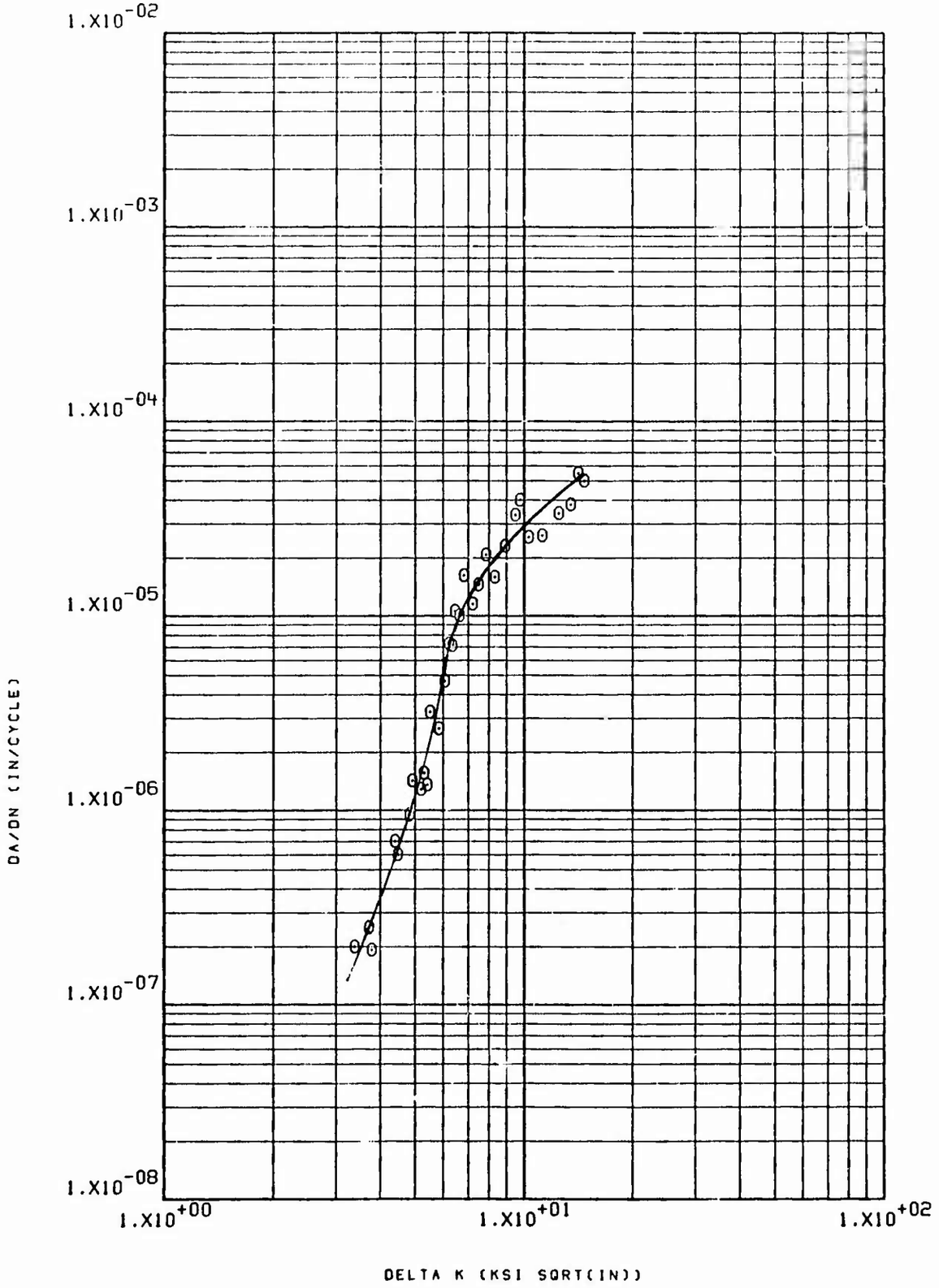
26 NRW 72-32 7175-T73652 FORG LHA 265F R=.08 360CPM



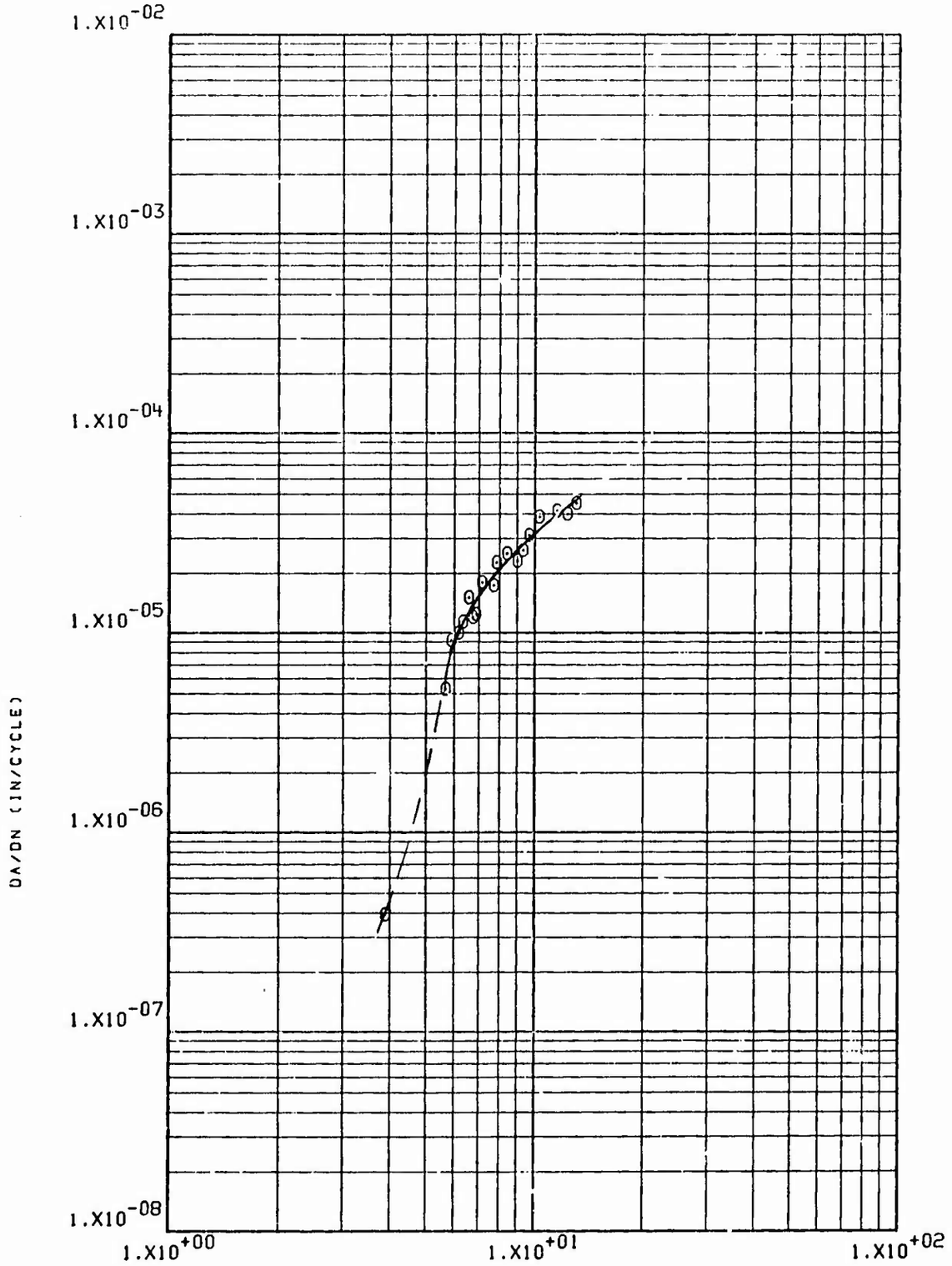
26 NRW 72-33 7175-T73652 SUMP RT R=.08 6CPM



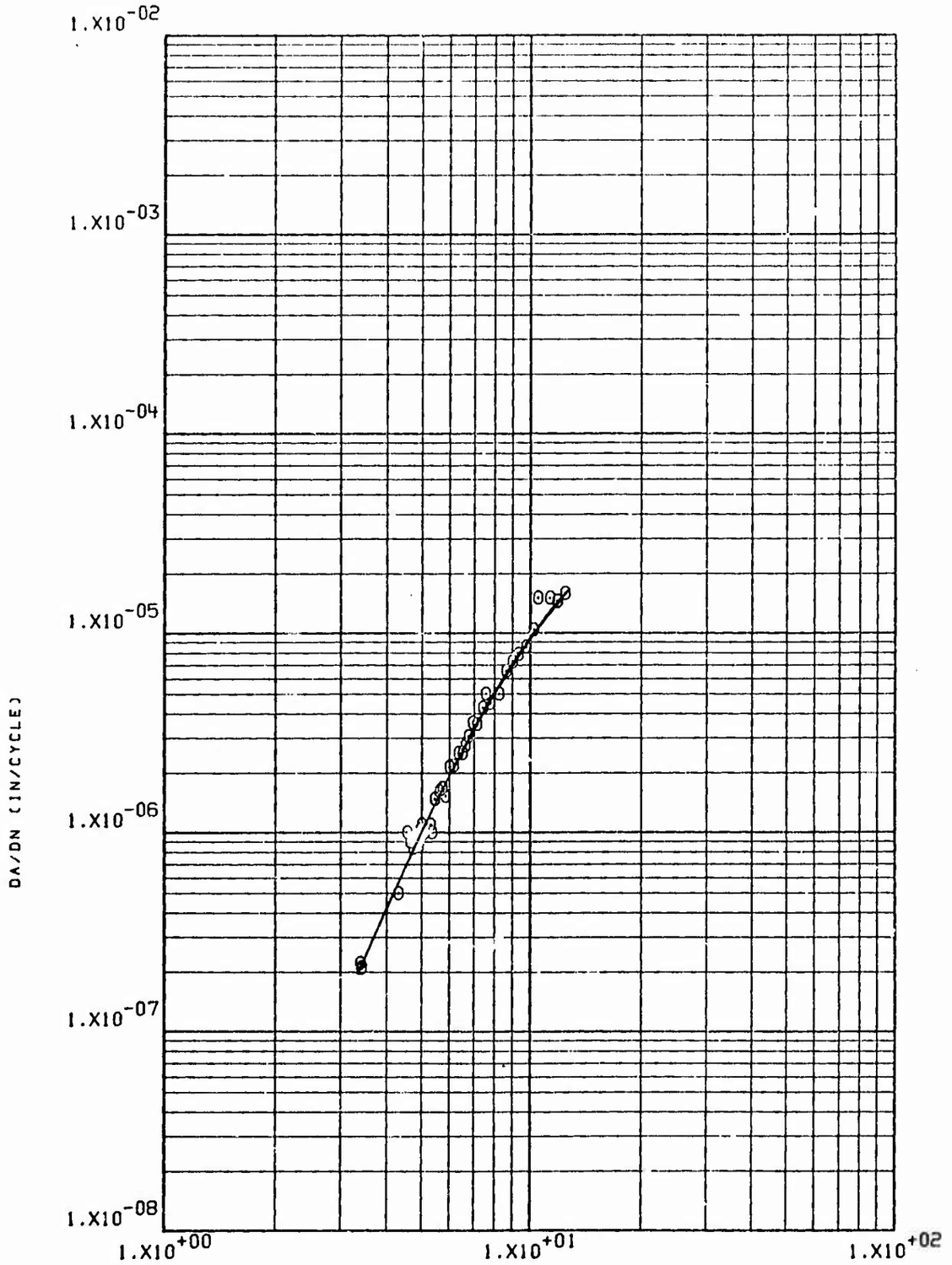
26 NRW 72-34 7175-T73652 SUMP RT R=.08 60



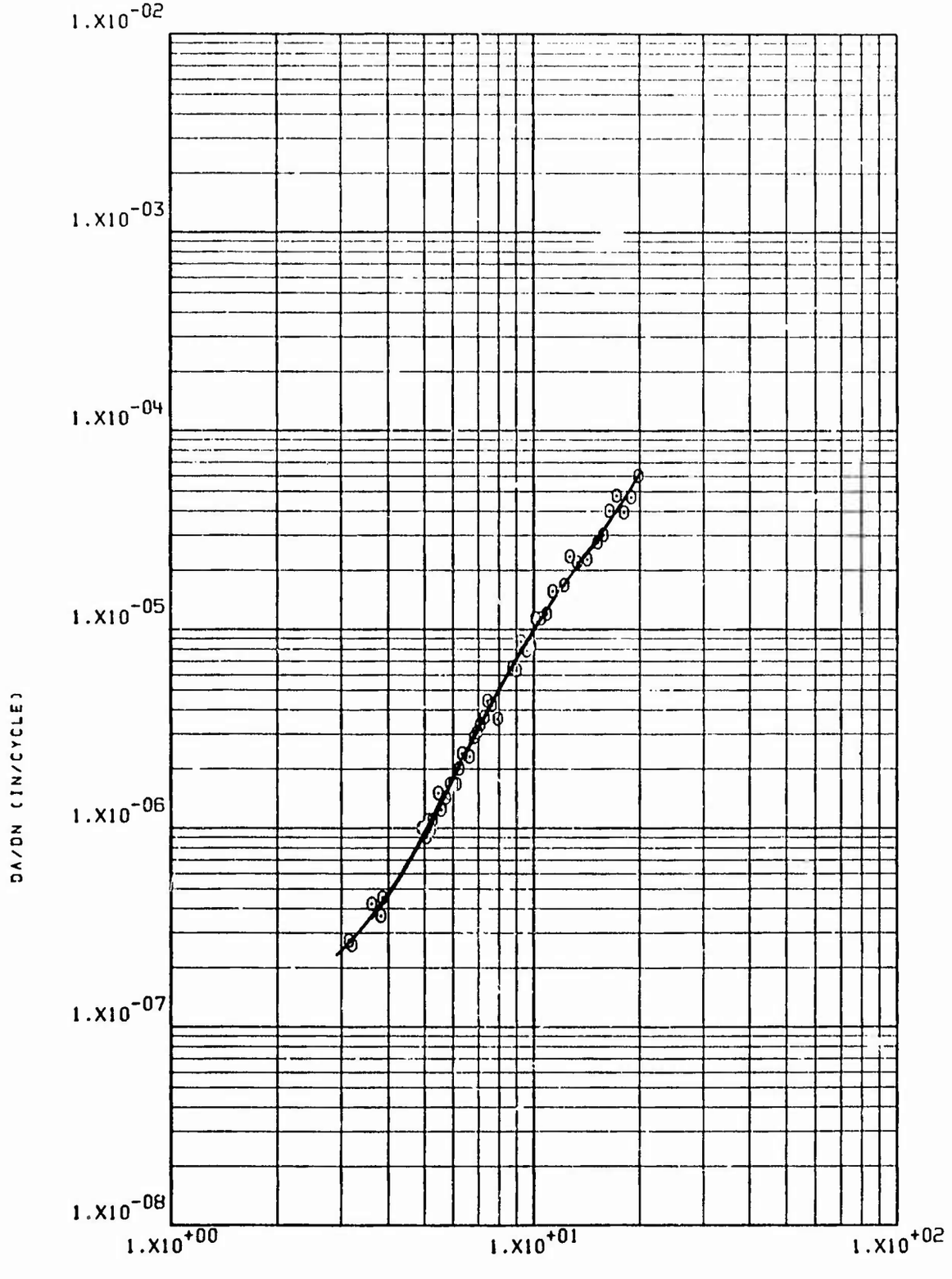
26 NRW 72-35 7175-T73652 ALUMHAND FORGING SUMP RT R=.3 60CPM



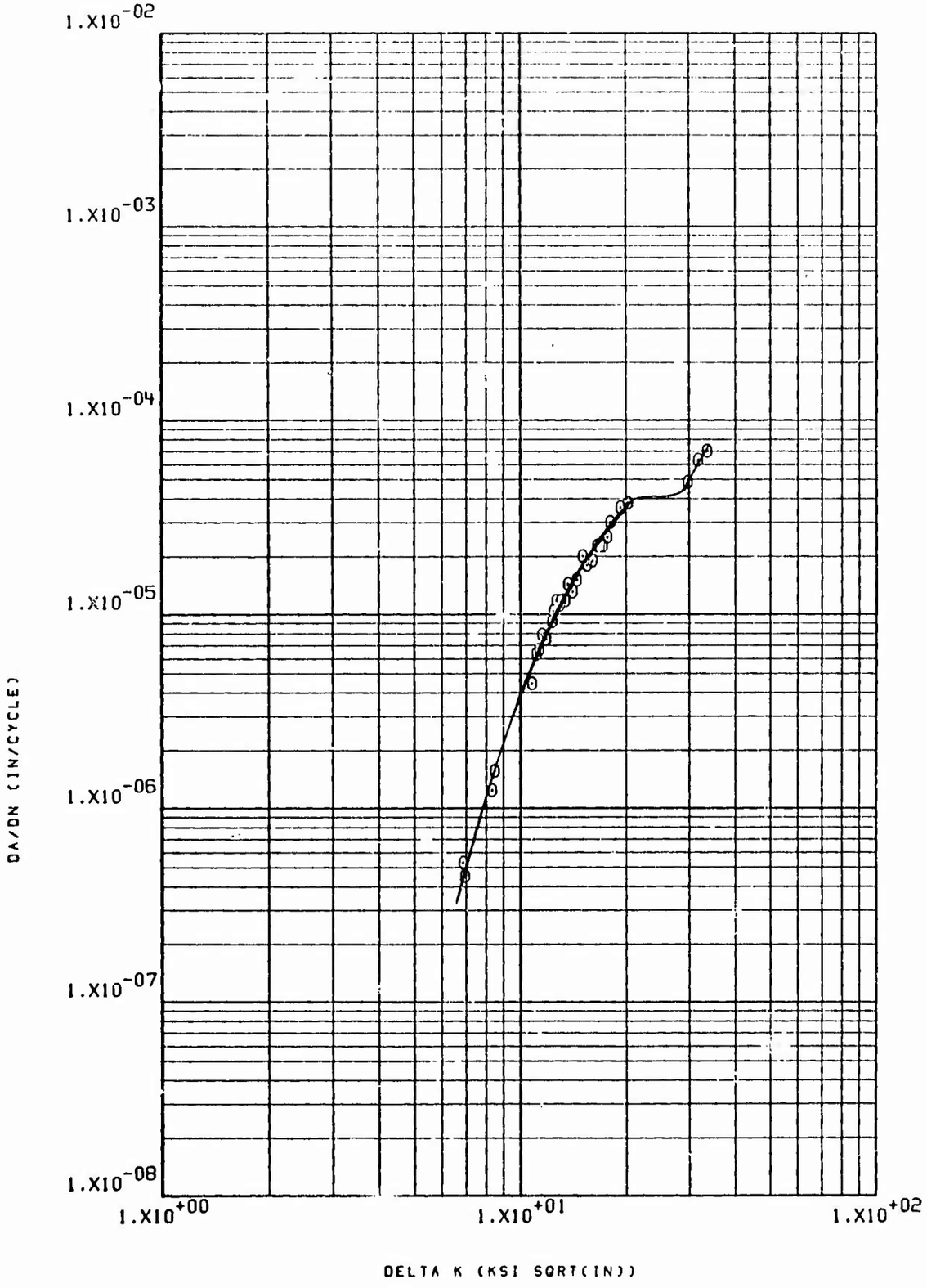
26 NRW 72-36 7175-T73652 ALUM HAND FORGE SUMP RT R=.5 60CPM



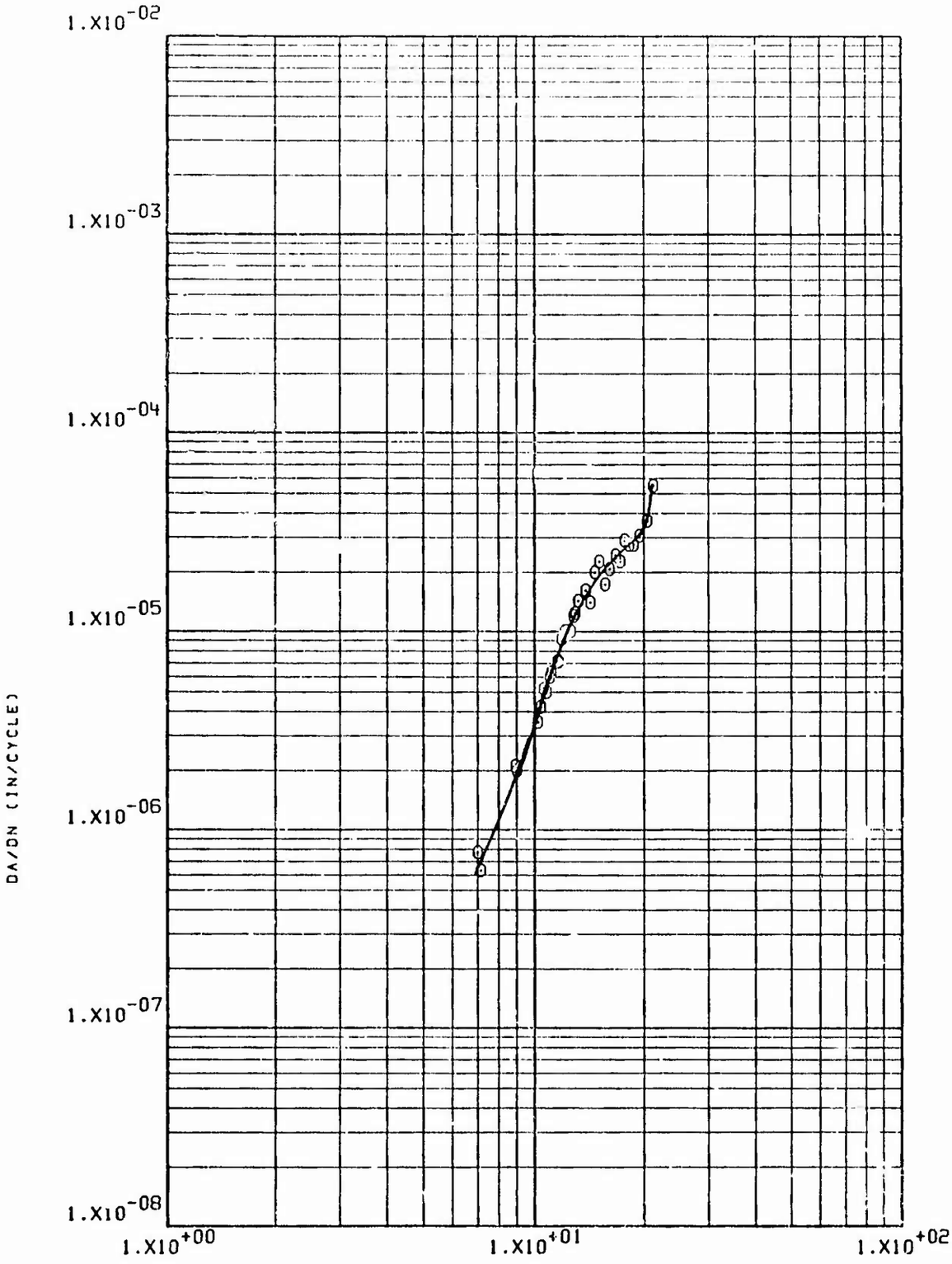
26 NRW 72-37 7175-T73652 AL HD FRGE SCS RT 60CPM R=.03



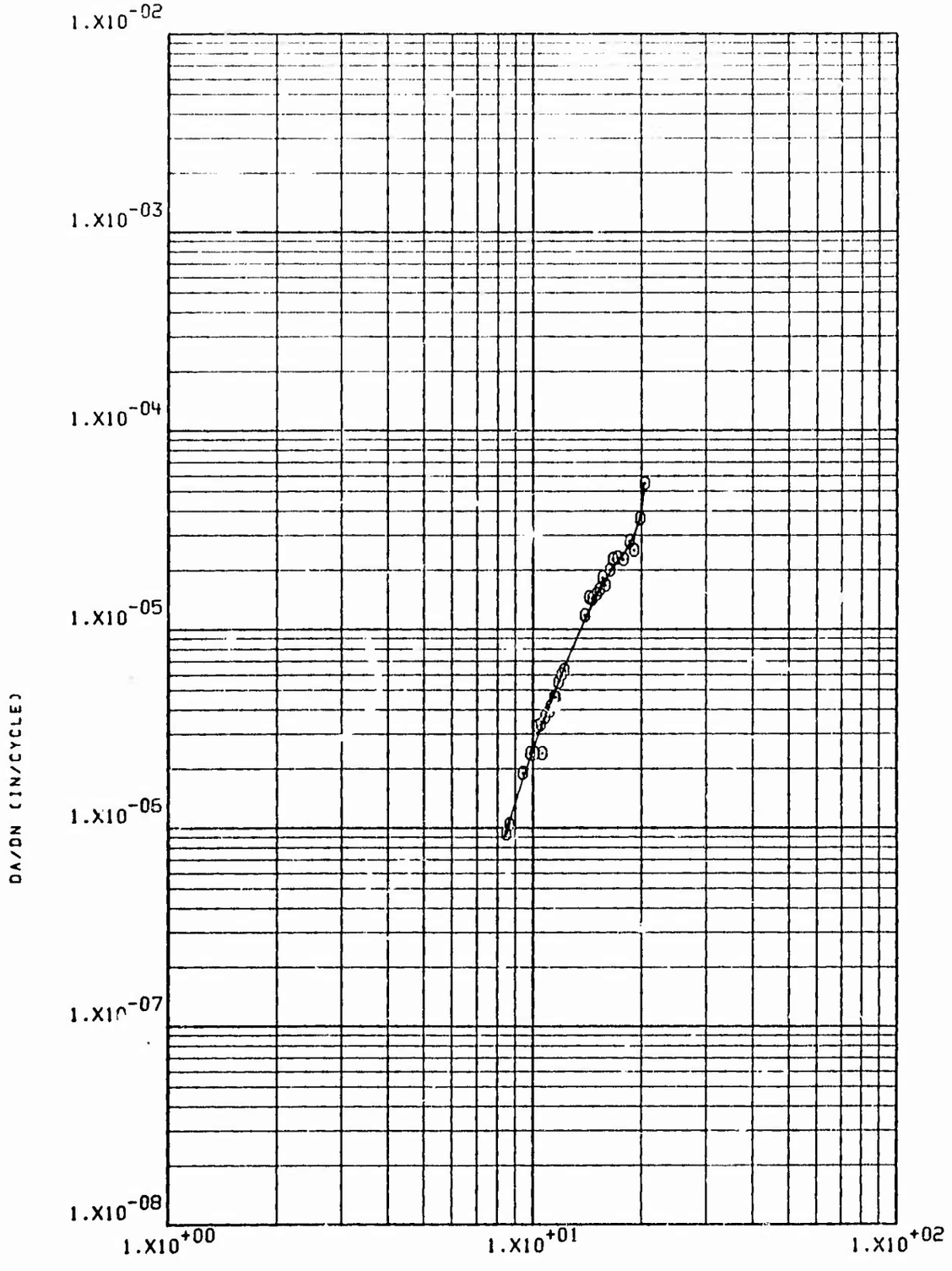
26 NRW 72-38 7175-T73652 AL HD EDGE FIELD RT R=.08 60CPM



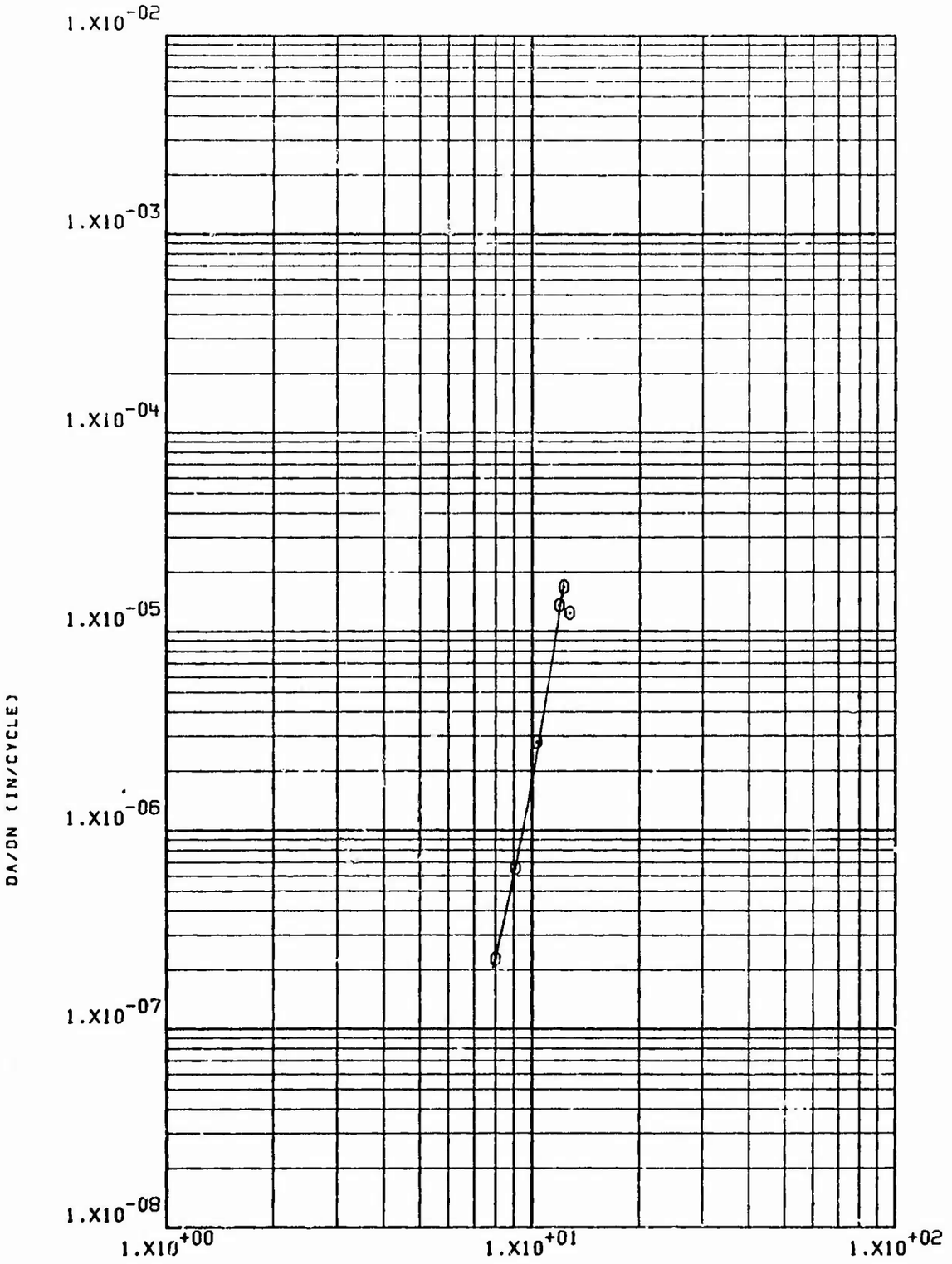
26 NRW 72-40 7175-T73652 FORGING LHA RT R=.08 360CPM



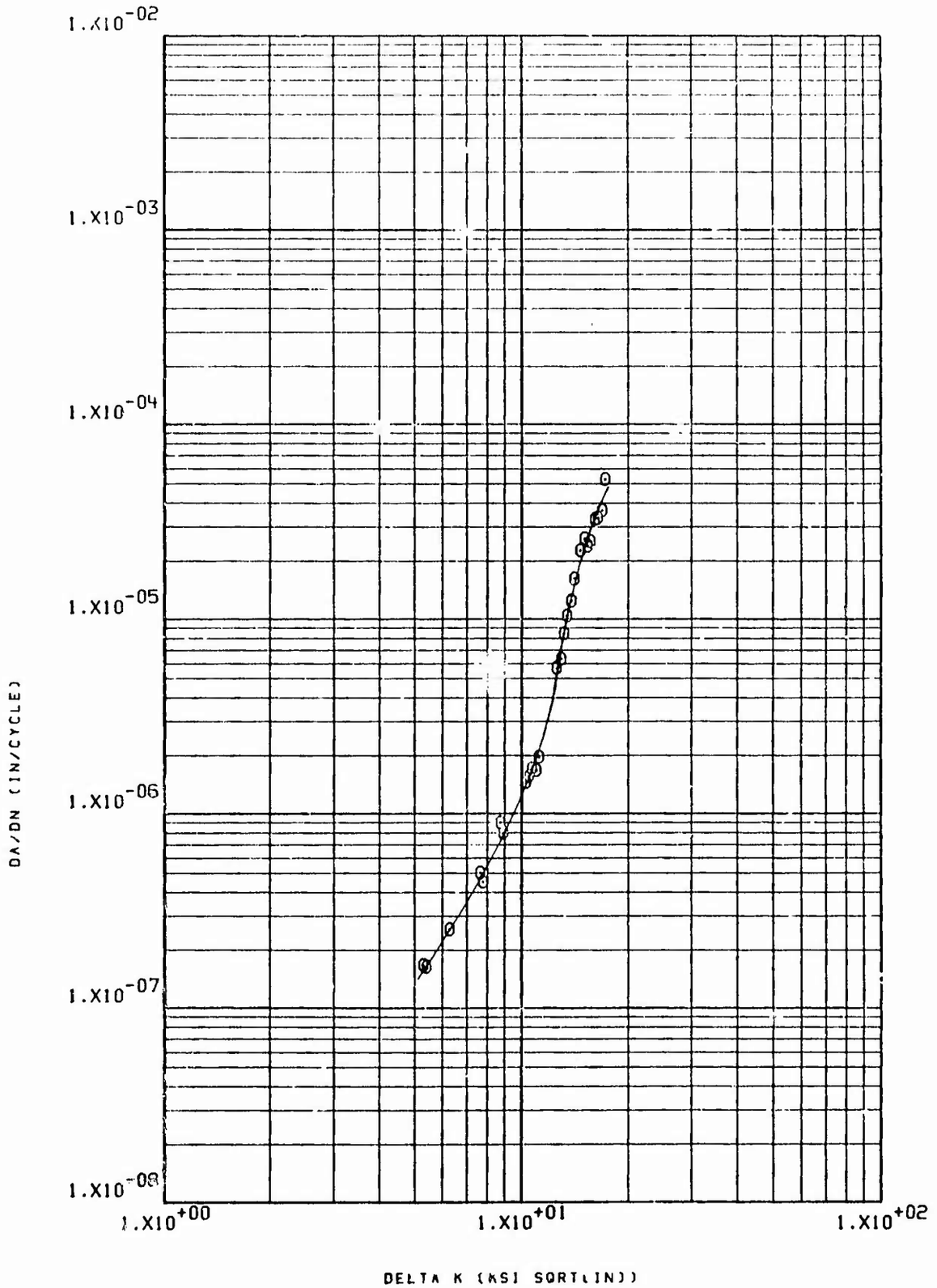
26 NRW 72-41 7175 173652 AL HD EDGE LHA RT R=.08 360CPM



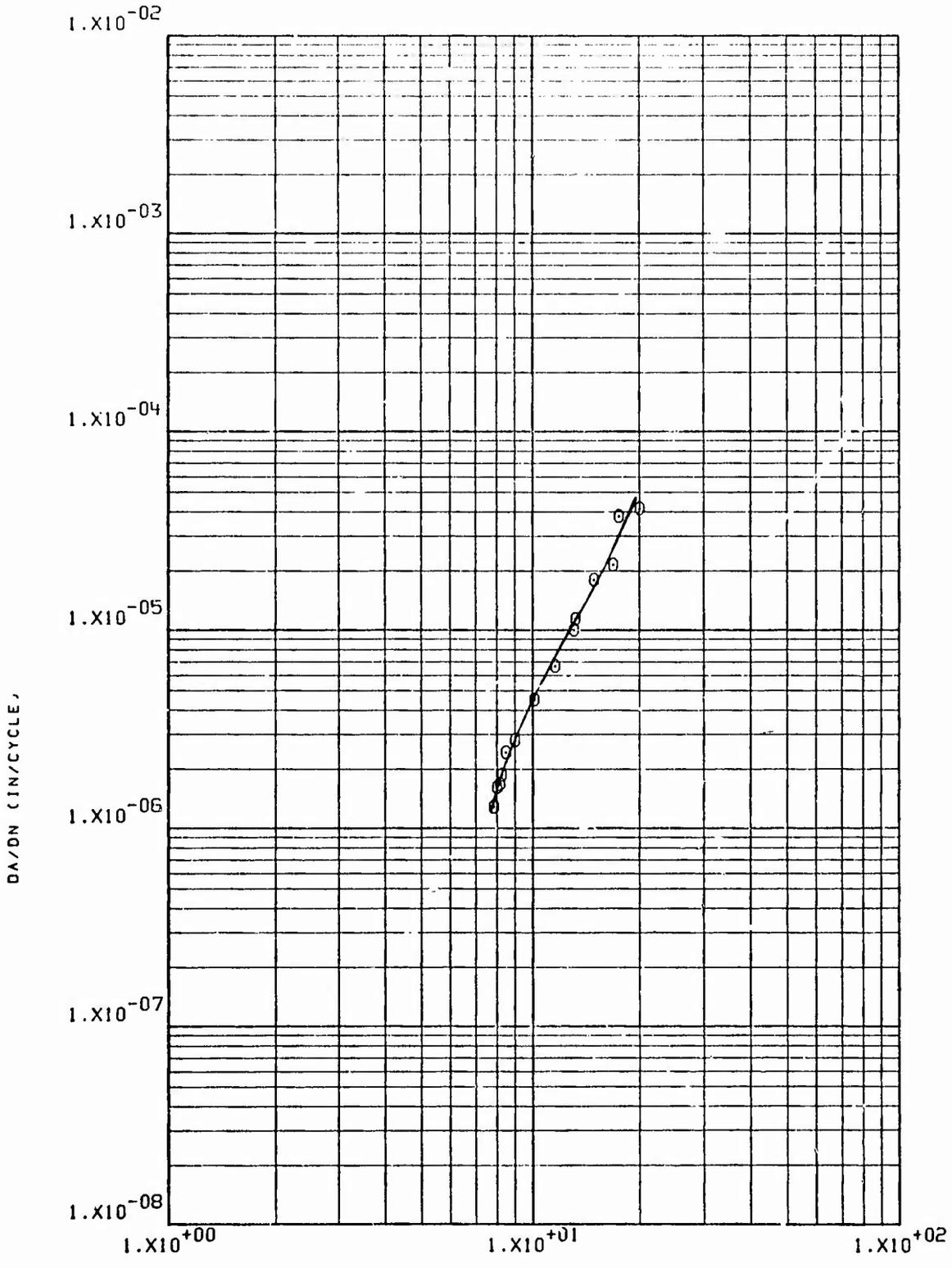
26 NWR 72-44 7175 T73652 ALUM HD FRGE LHA RT R=.08 360CPM



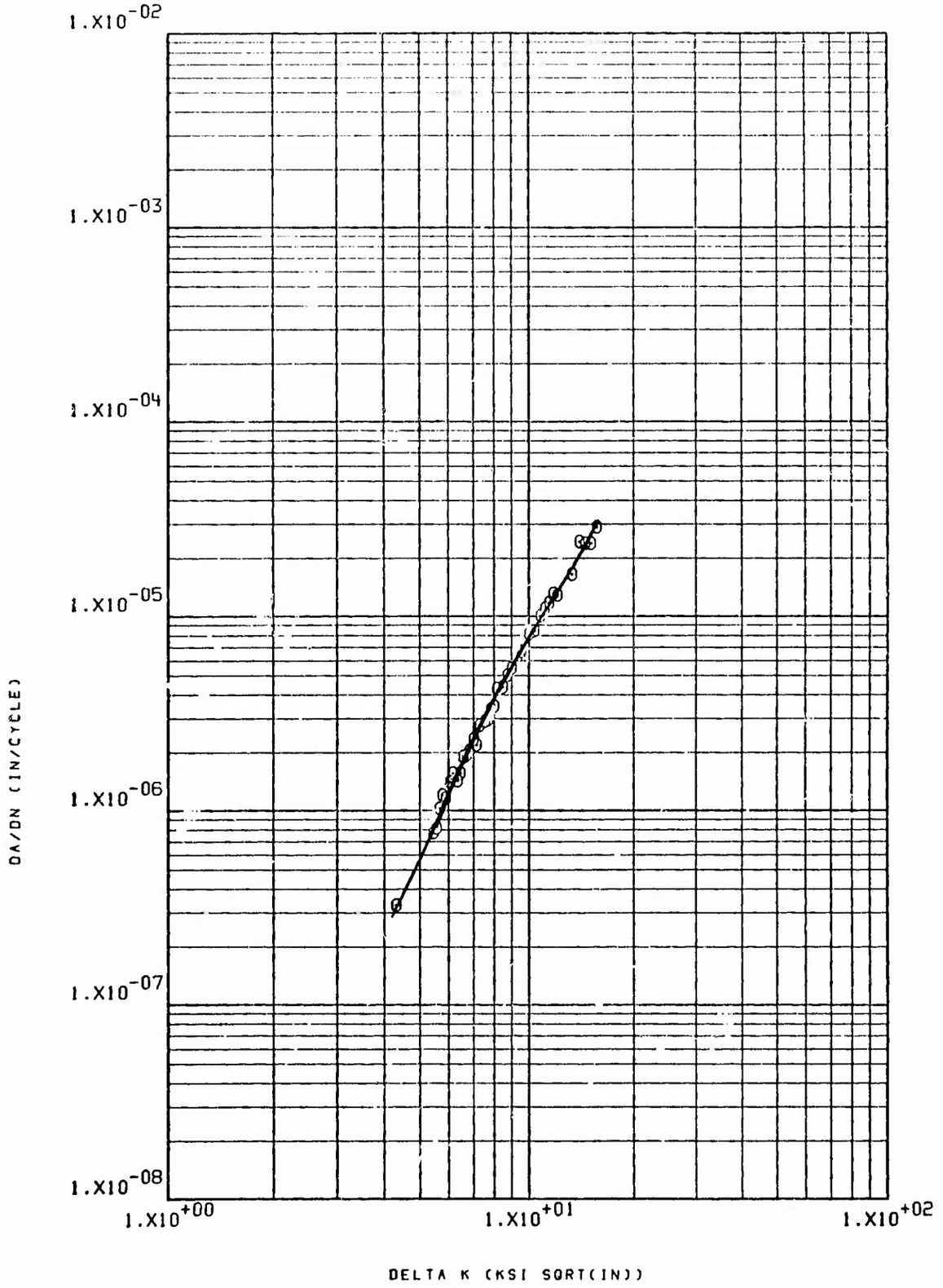
26 NWR 72-45 7175-173652 HD FDGE SUMP RT R=.08 60CPM



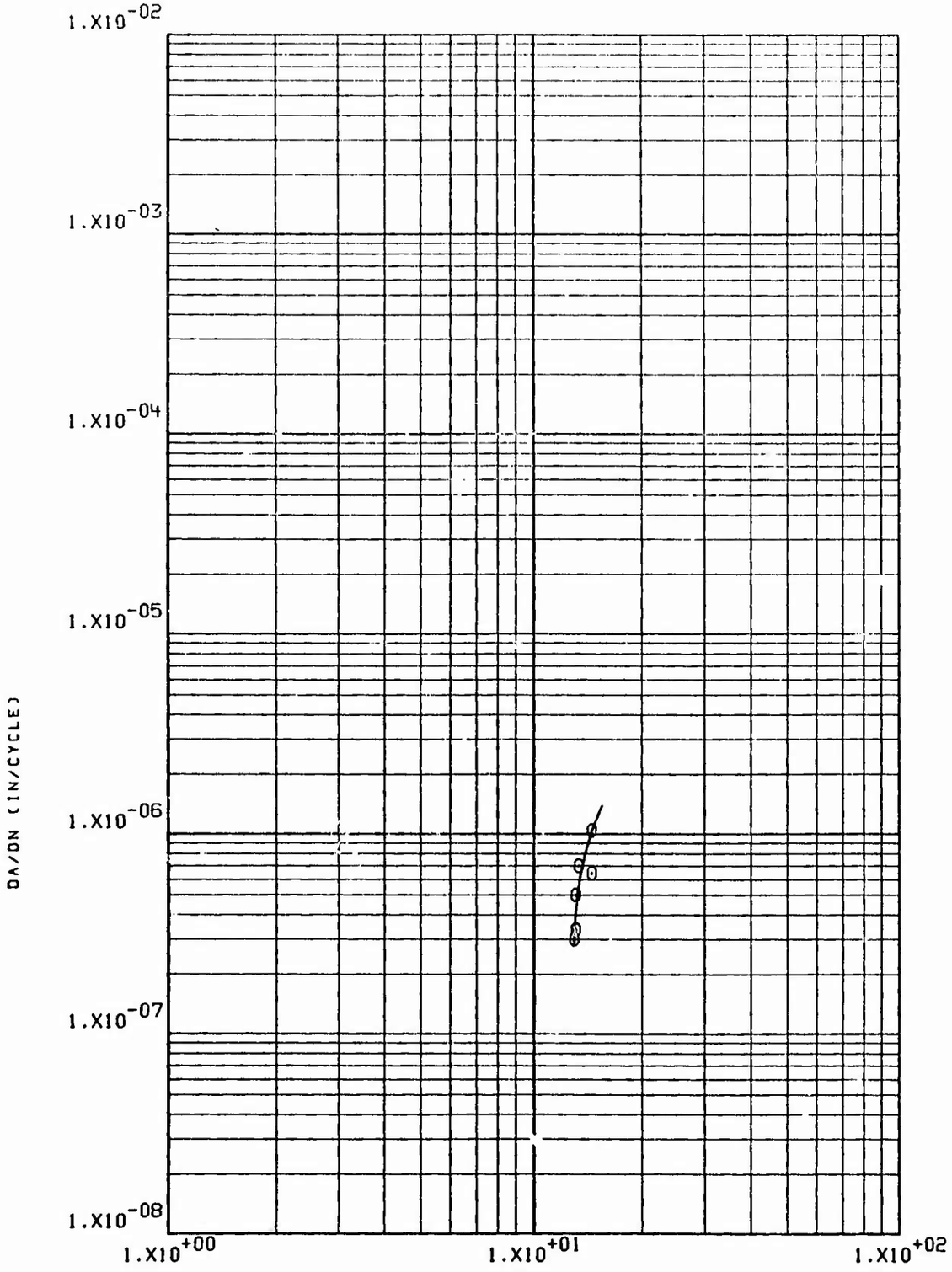
26 NWR 72-46 7175-T73652 FORGING LHA BT R=.08 360CPM



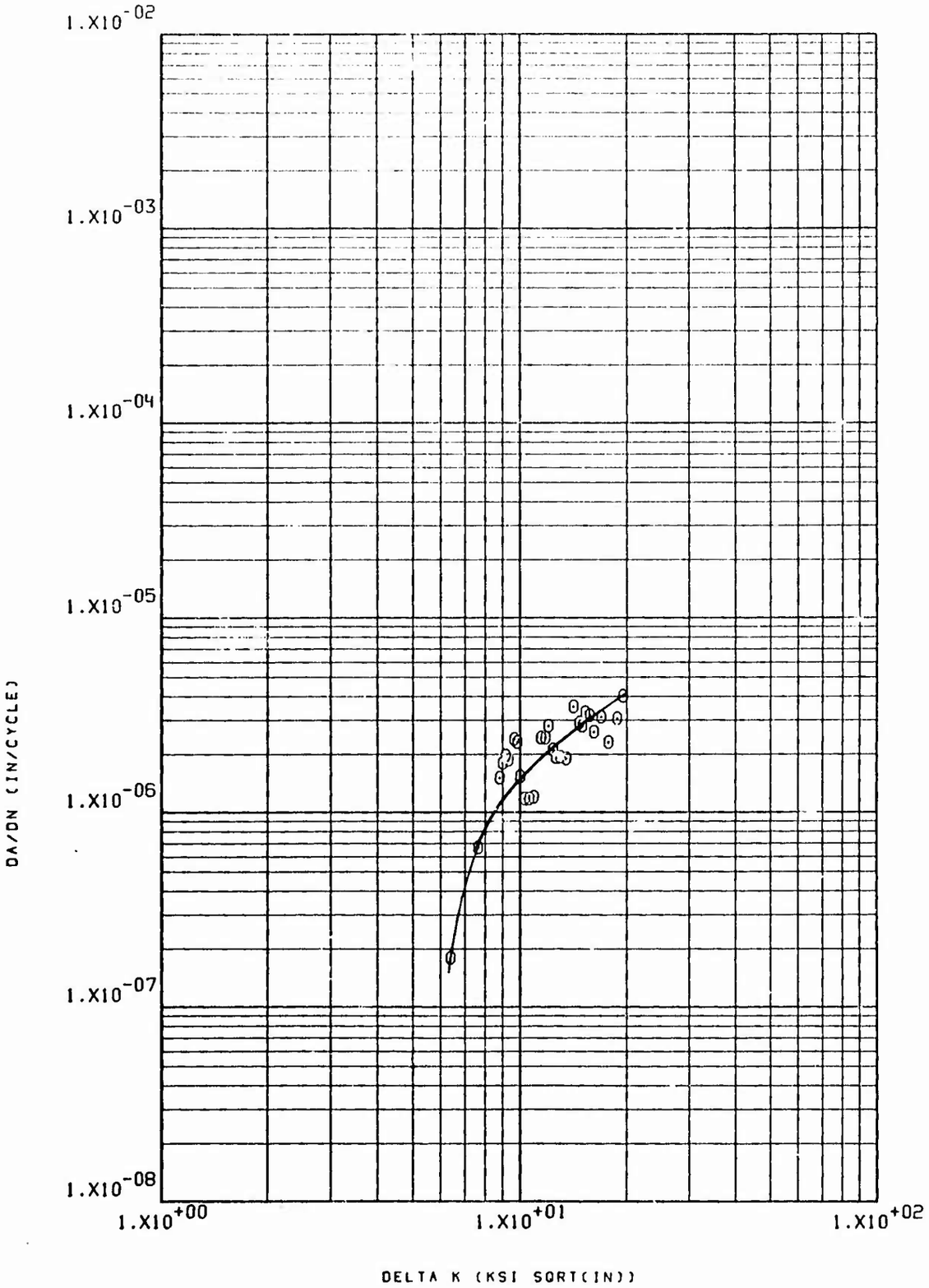
27 NRW 75-1 2024-T852 FORGING LHA RT R=.08 6CPM



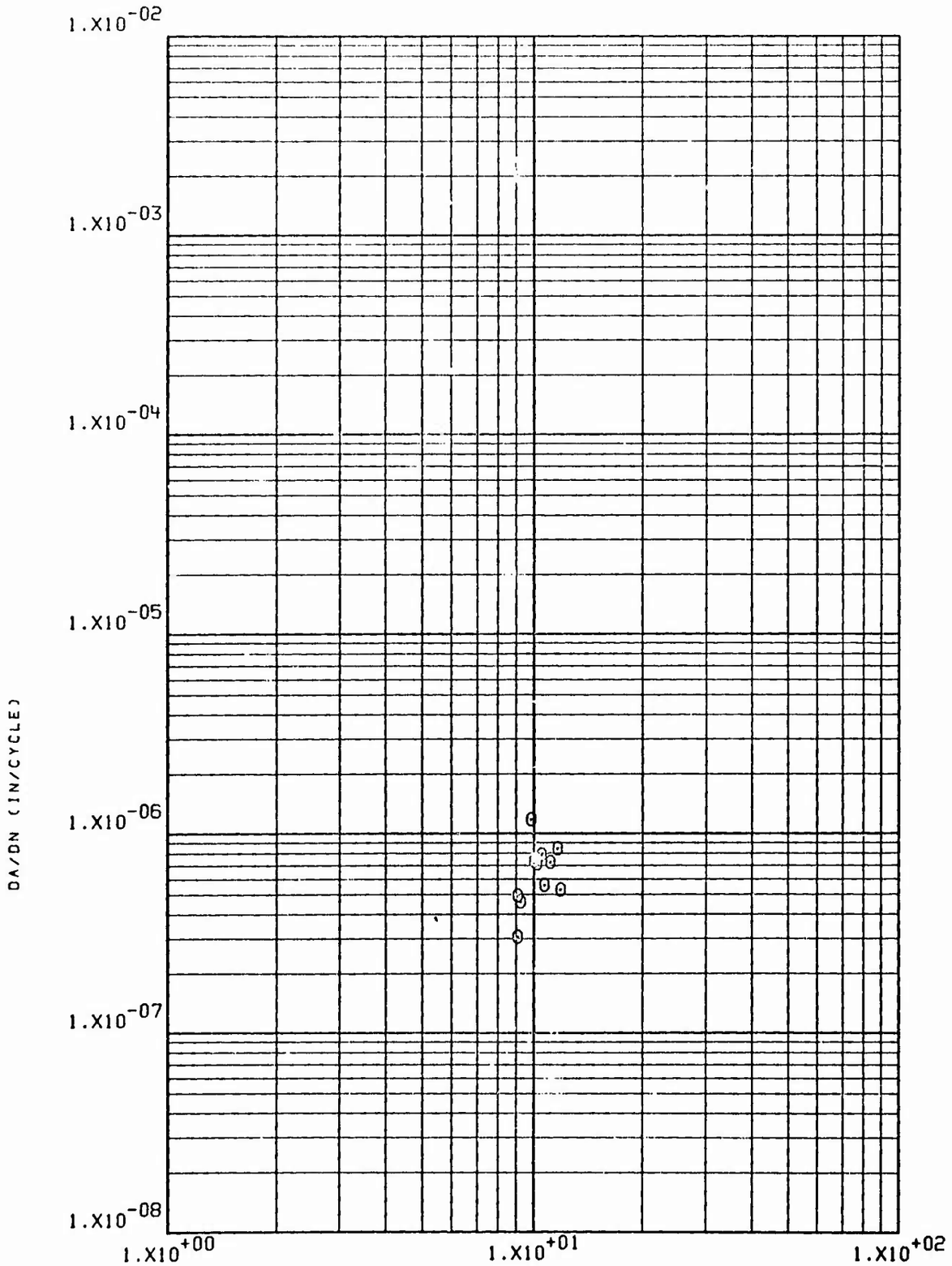
27 NRW 75-2 2024-T852 FORGING LHA 60CPM R=.08 RT



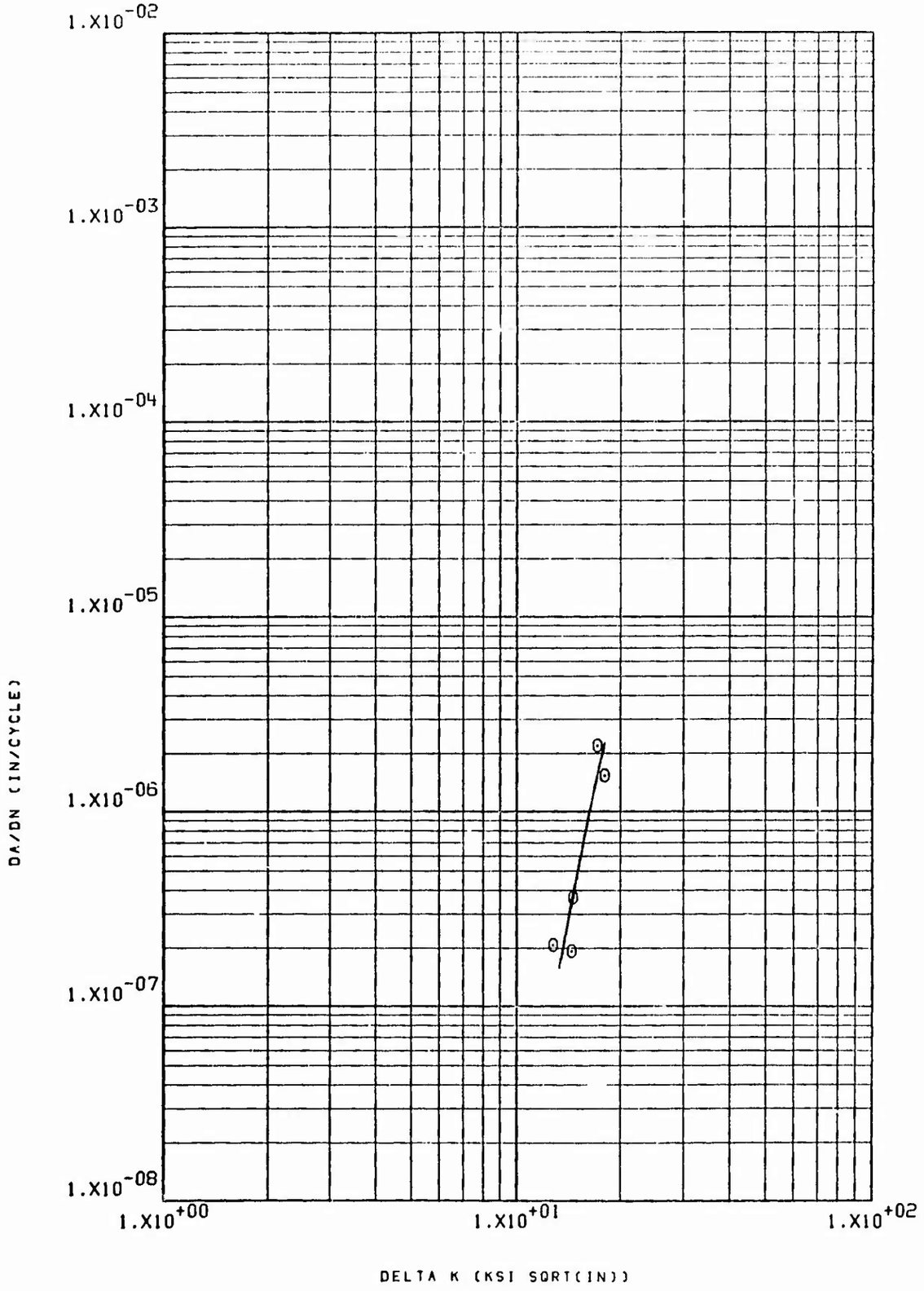
27NRW75-3 2024-T852 HD FORGE LHA RT 360CPM R=.08



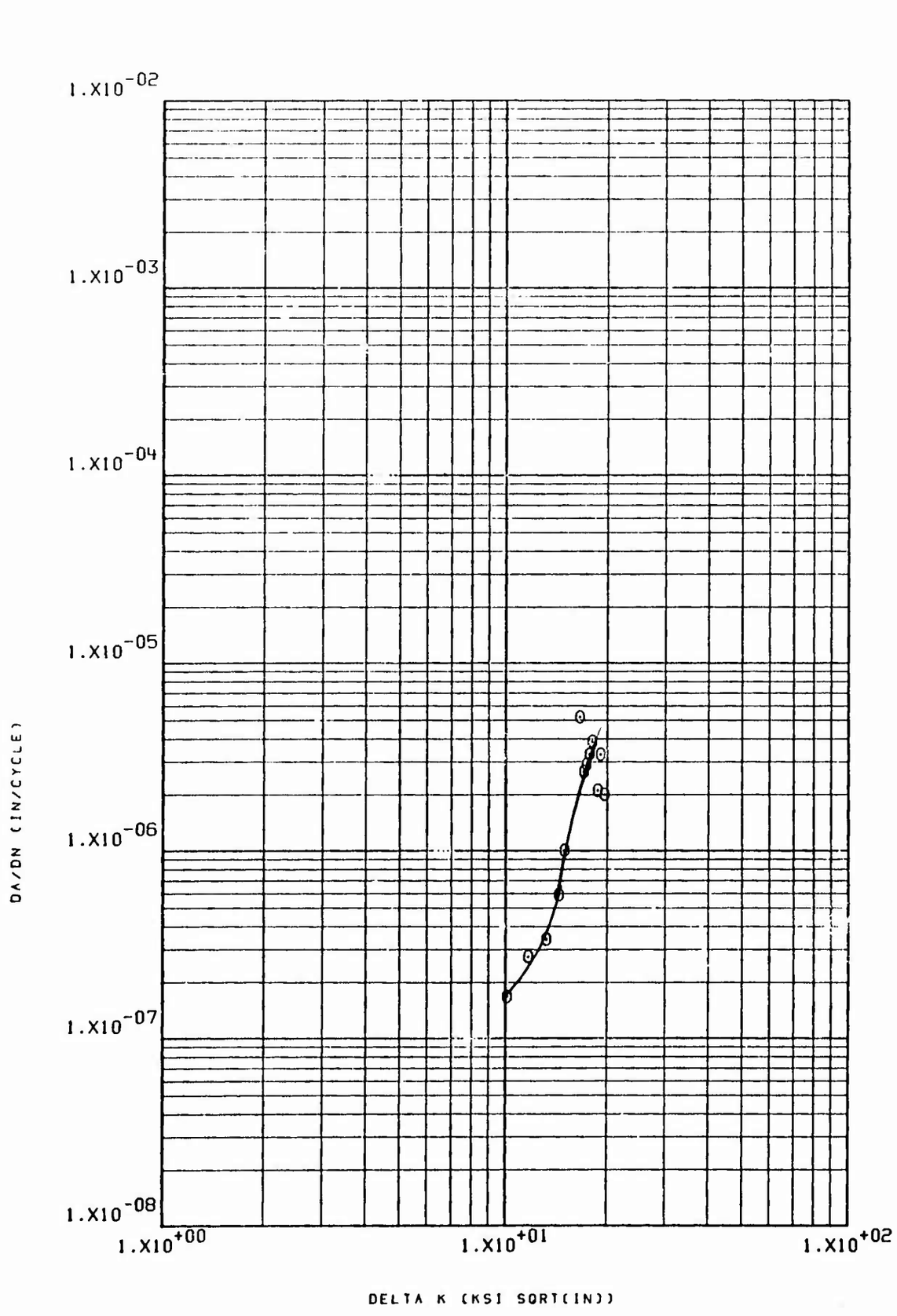
27 NRW 75-4 2024-T852 FORGING LHA RT 360CPM R=.3



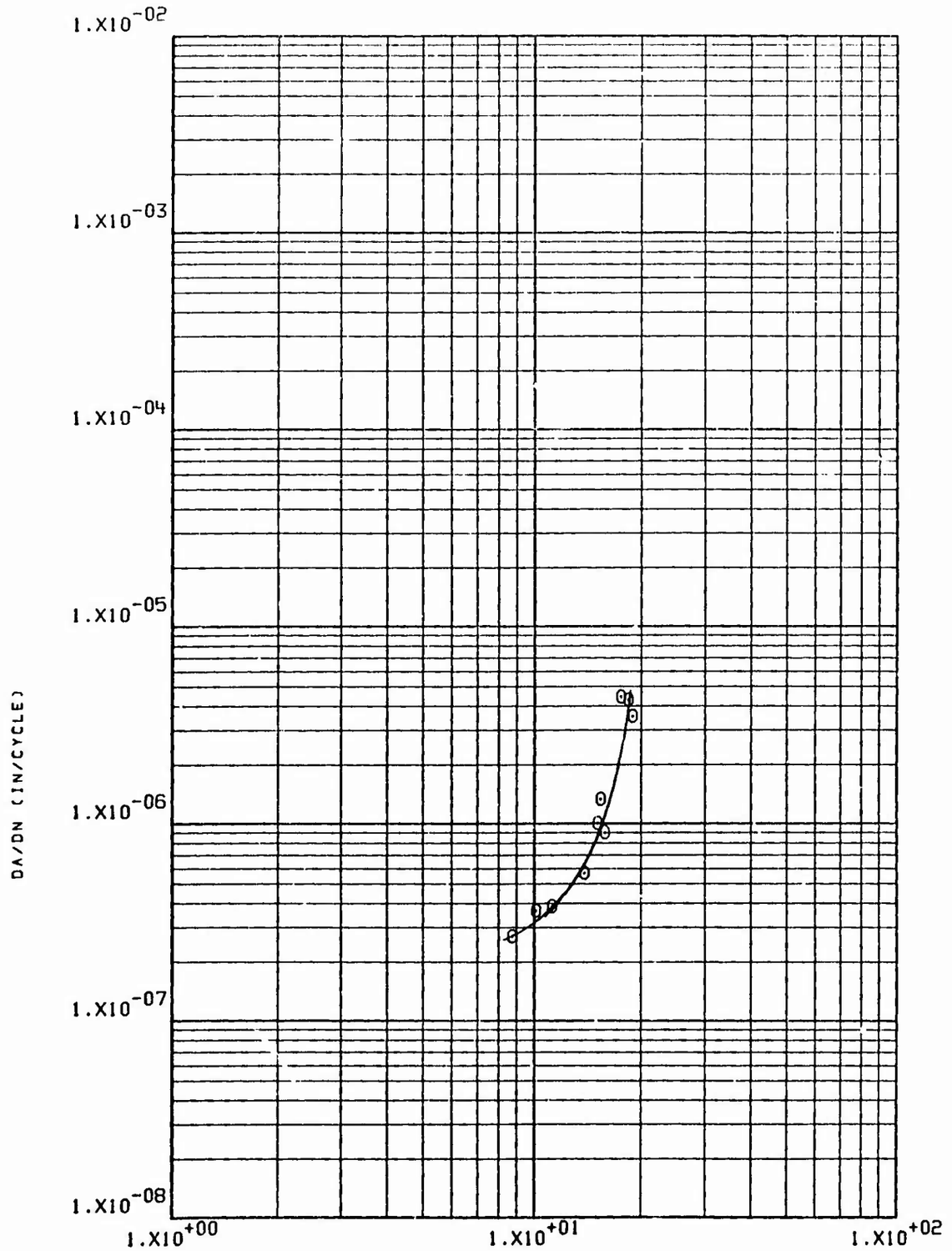
27 NRW 75-5 2024-T852 FORGING LHA RT 360CPM R=5



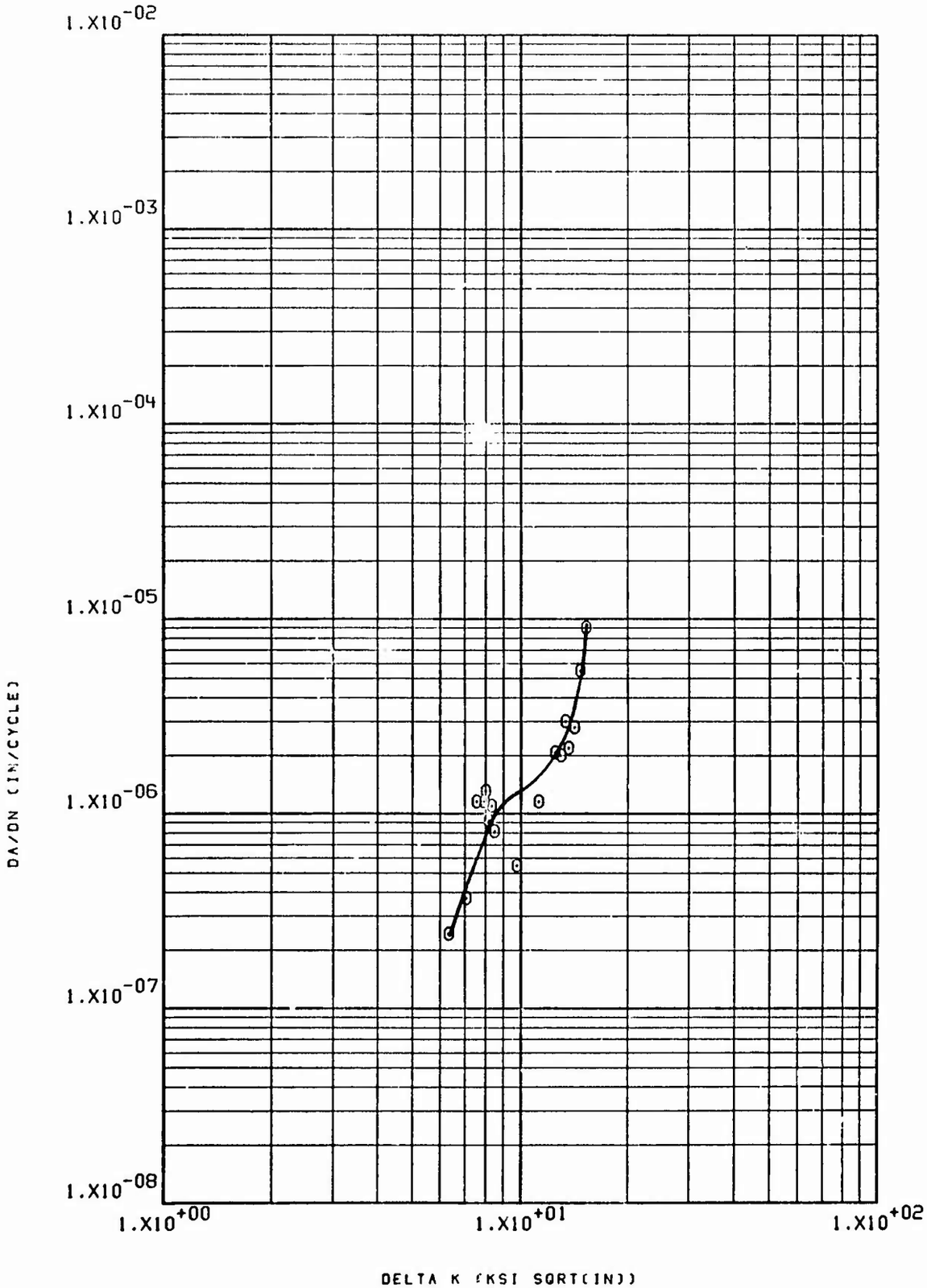
27 NRW 75-6 2024-T852 HAND FORGING FUEL RT 60CPM R=0.08



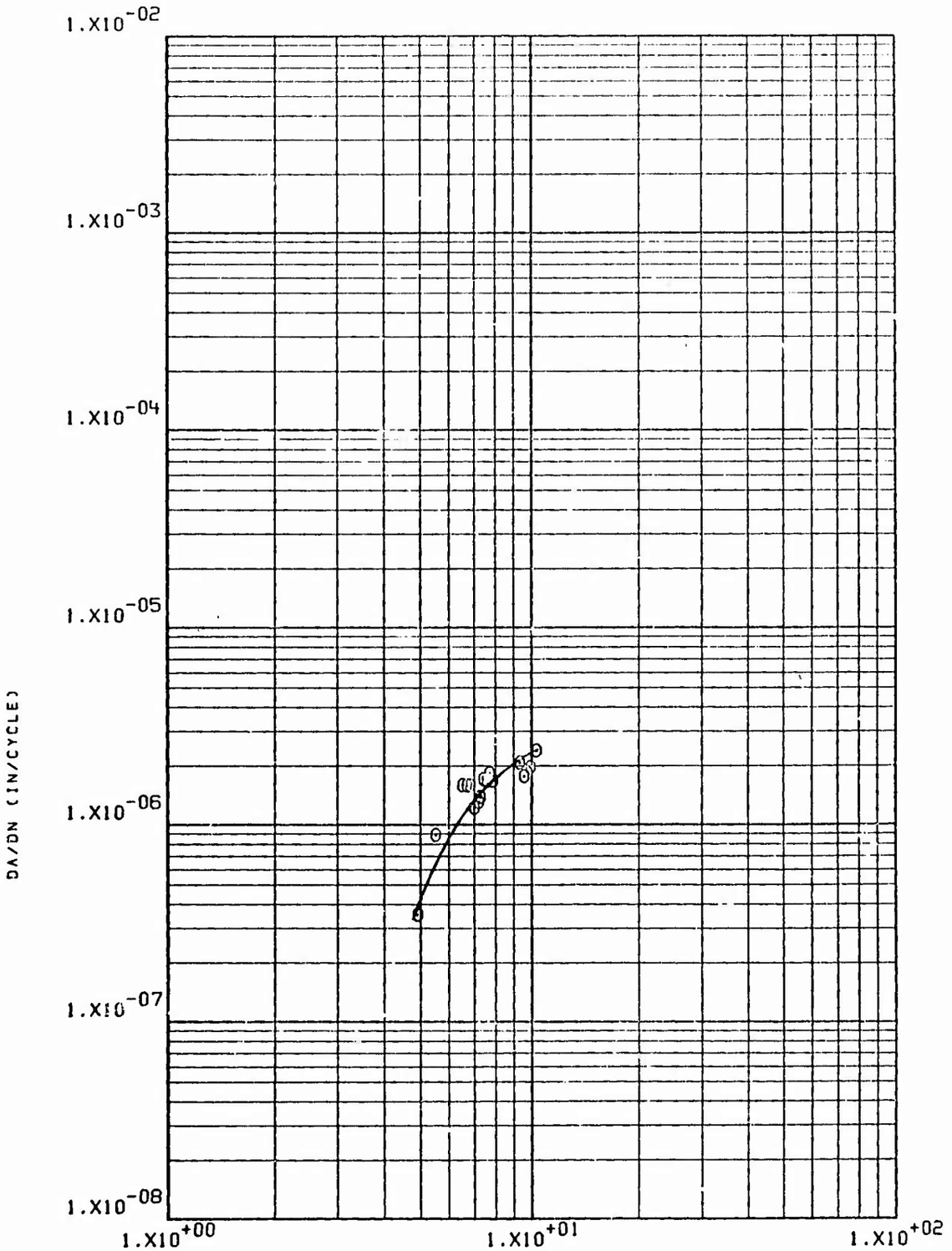
27 NRW 75-7 2024-T-852 HAND FORGING SUMP R.T. 60CPM R=.08



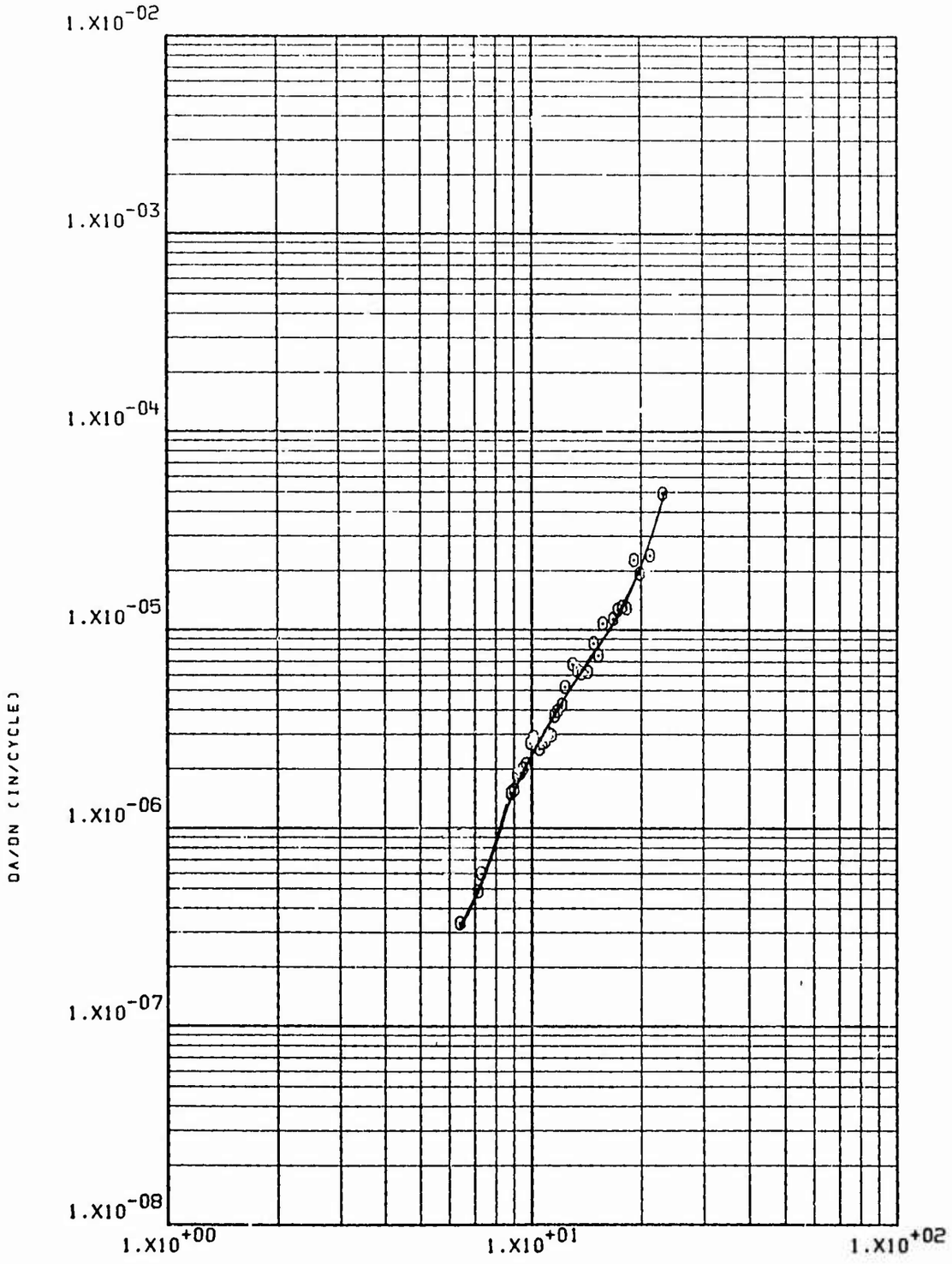
27 NRW 75-8 2024-T-852 HAND FORGING SUMP R.T. 60CPM R=.08



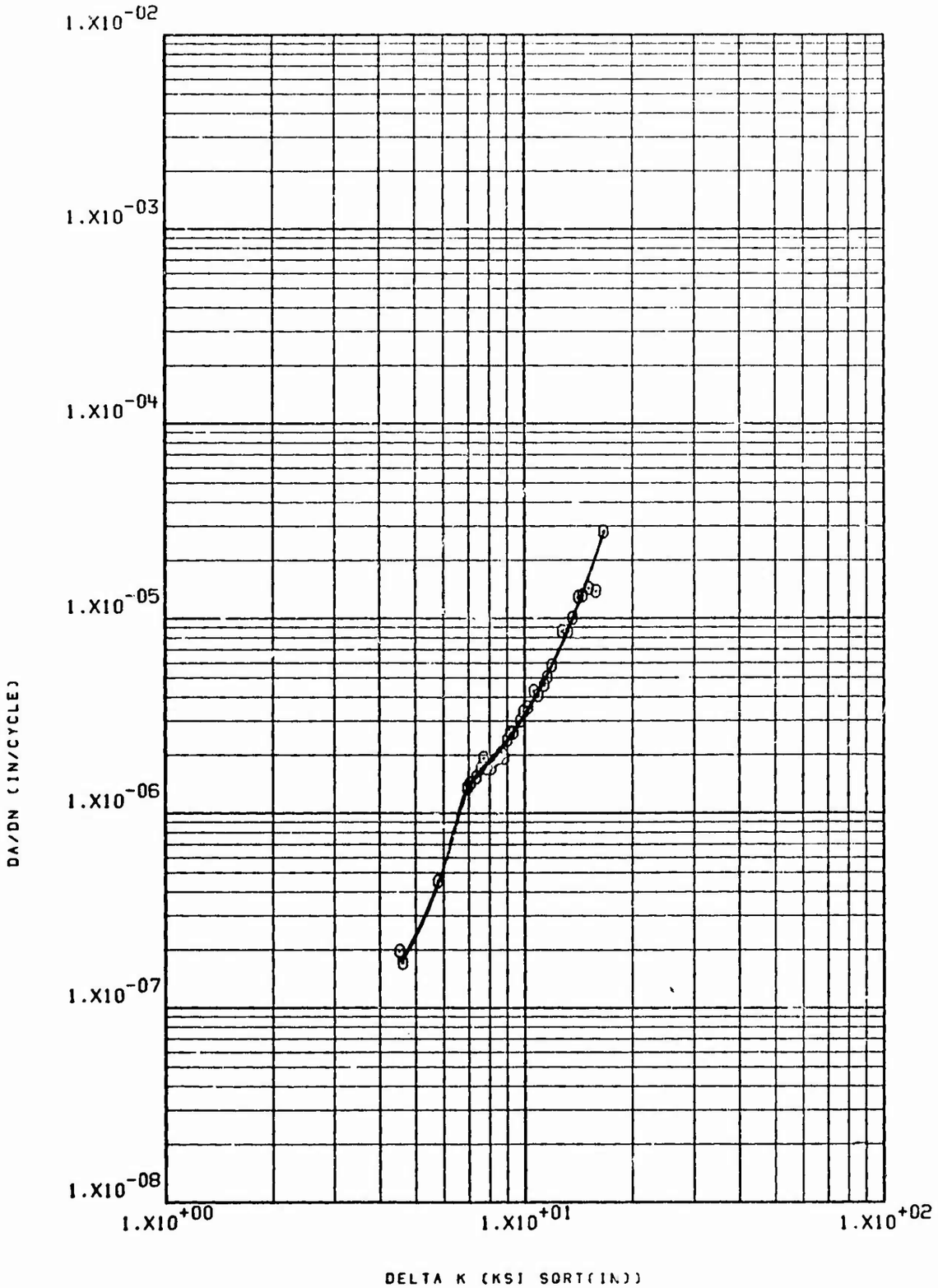
27 NRW 75-9 2024-T-852 HAND FORGING SUMP R.T. 60CPM R=.3



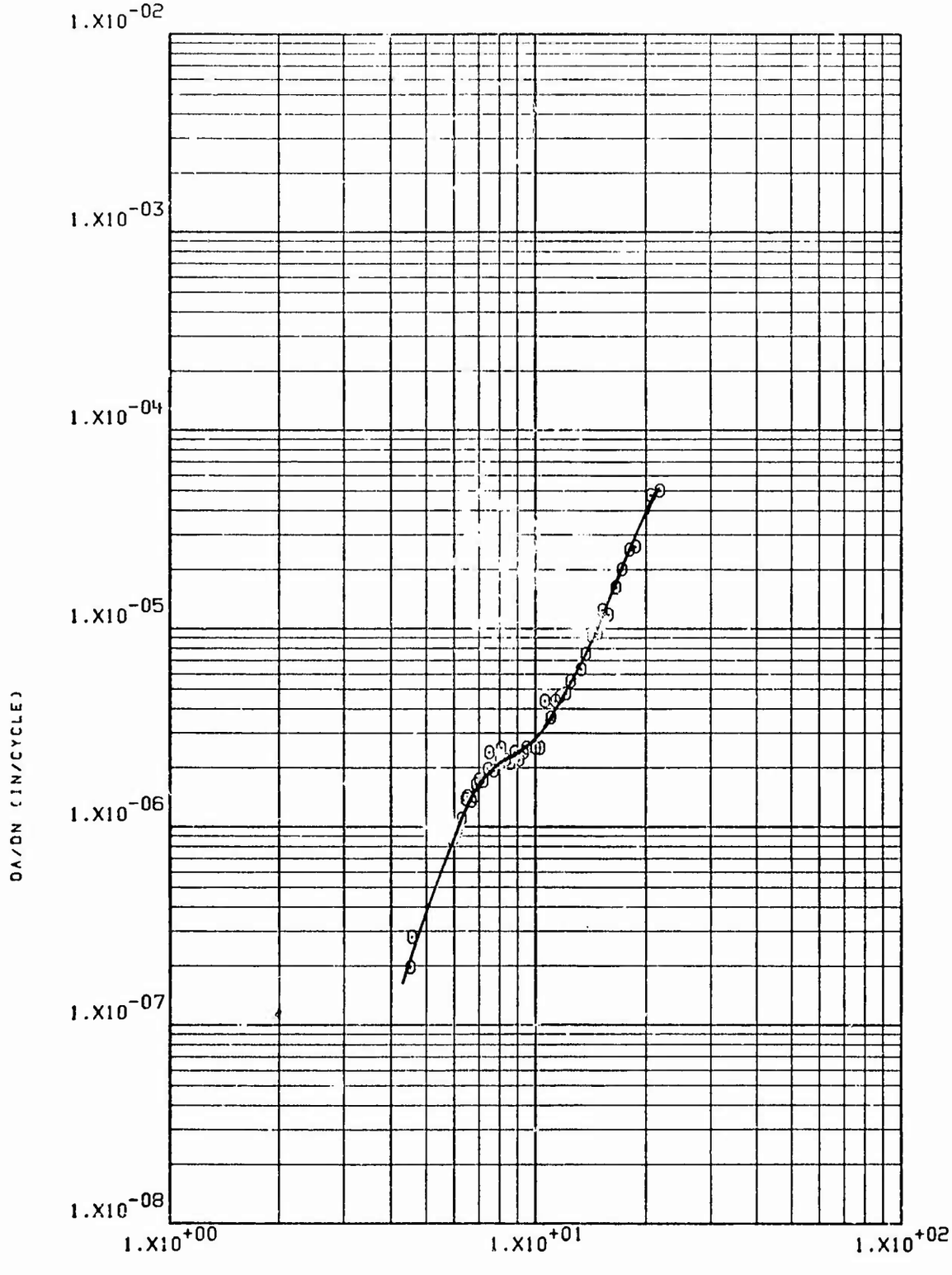
27 NRW 75-10 2024 T-852 HAND FORGING SUMP RT 60CPM R=.5



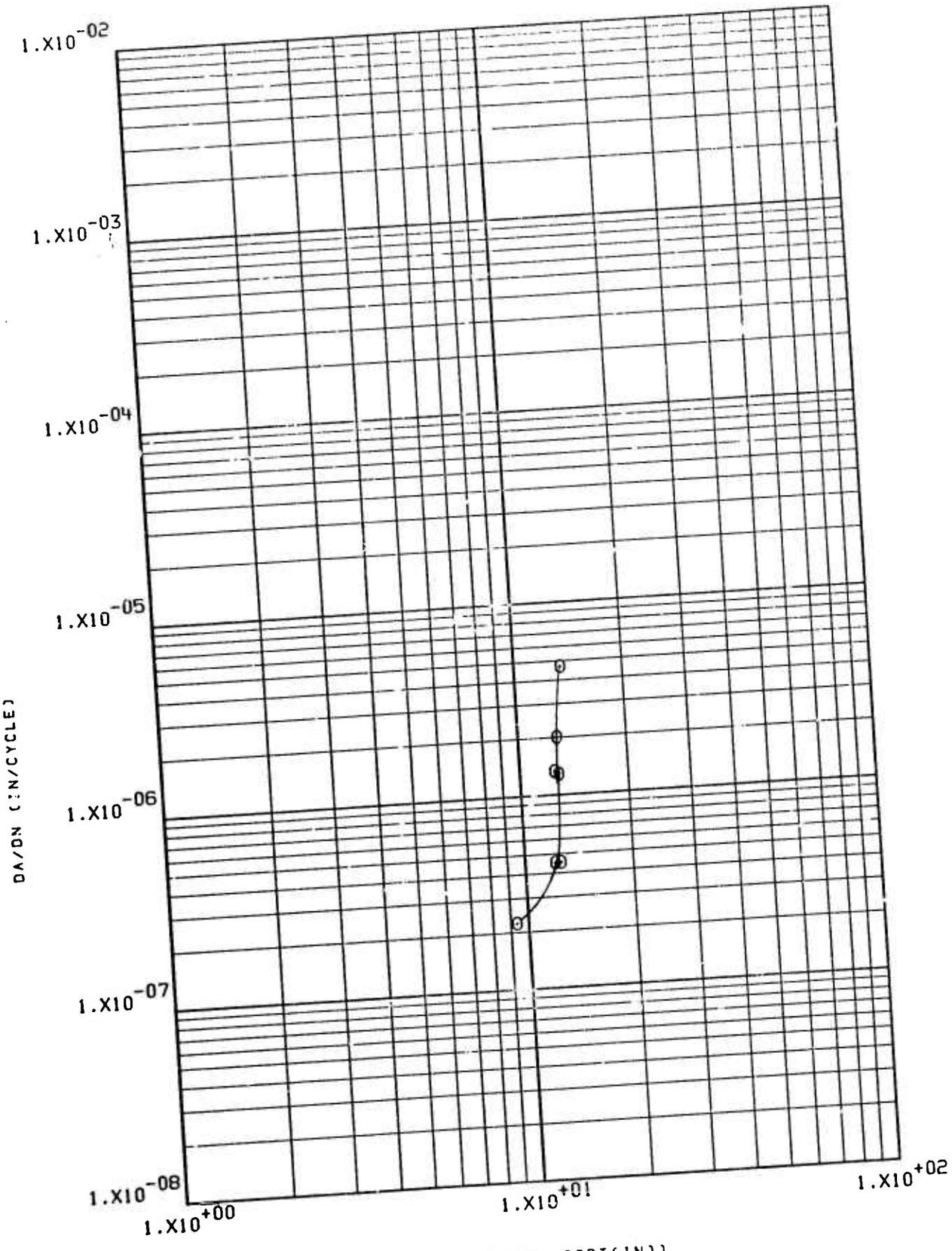
27 NRW 75-11 2024 T-852 HAND FORGING LHA RT 360CPM R=.08



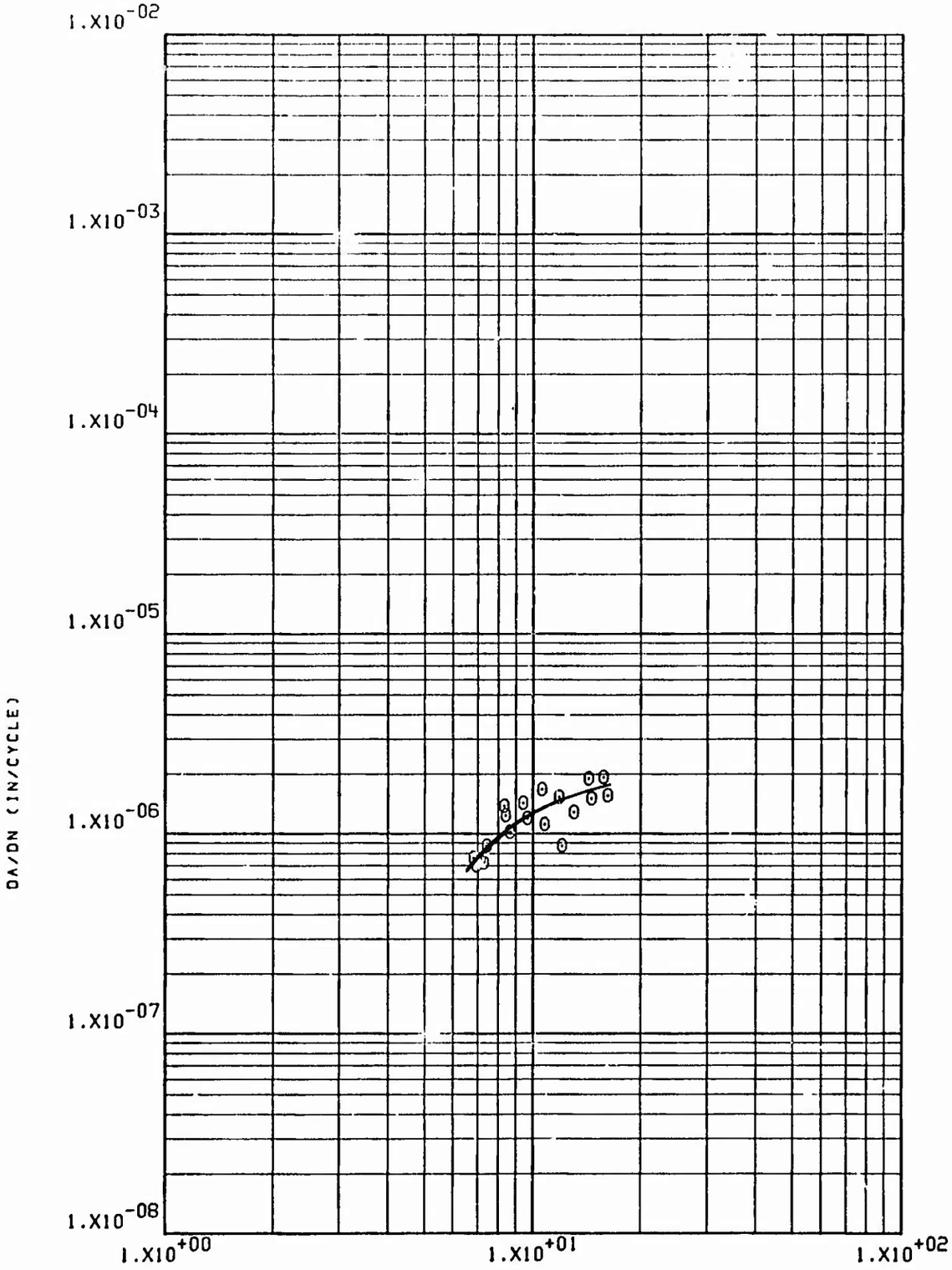
27 NRW 75-12 2024-T852 HAND FORGING LHA R.T. 360CPM R=.08



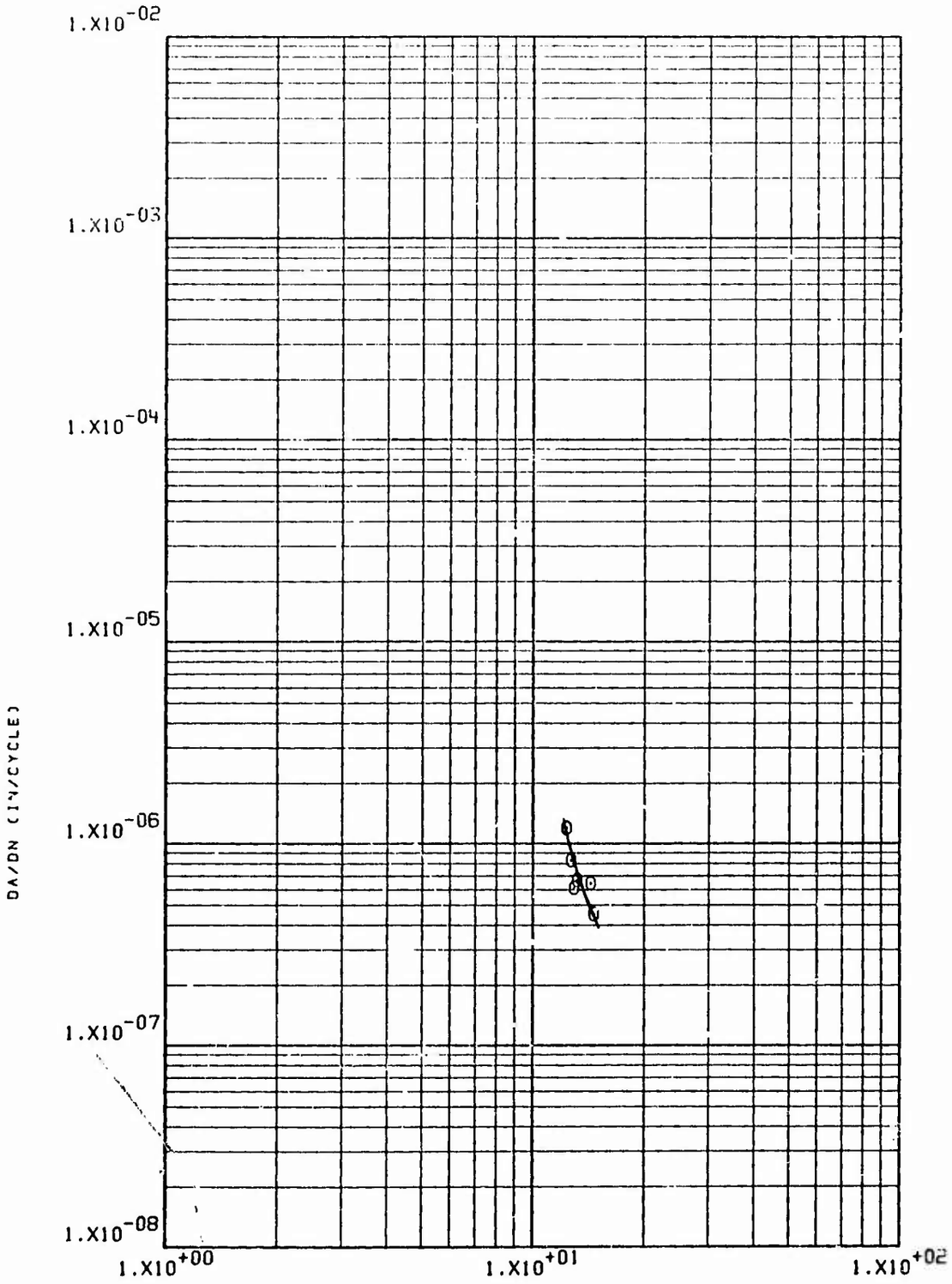
27 NRW 75-13 2024-T852 HAND FORGING LHA R.T. 360CPM R=.08



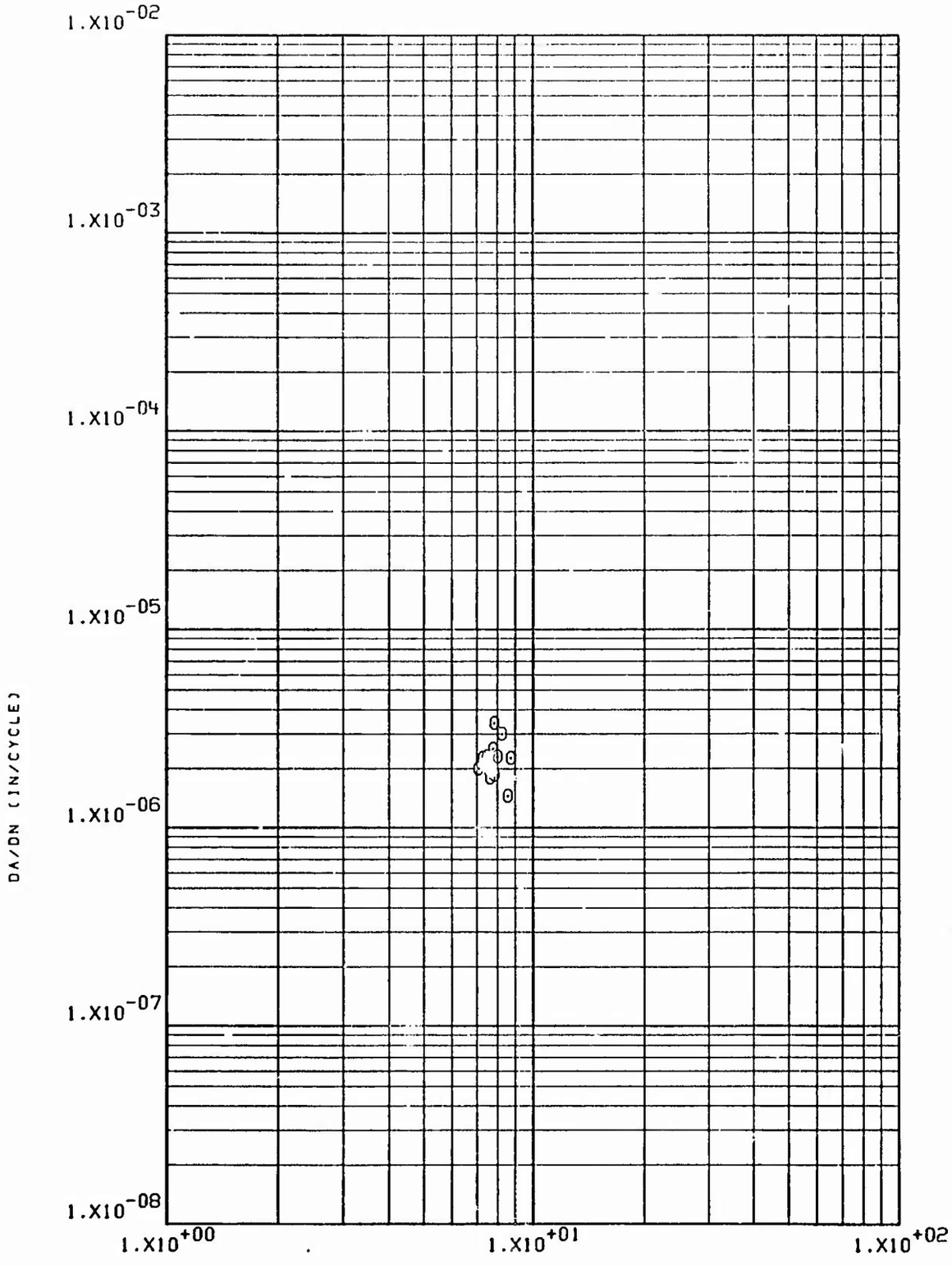
27 NRW 75-14 2024-T852 SUMP 150 F R=.08 60CPM



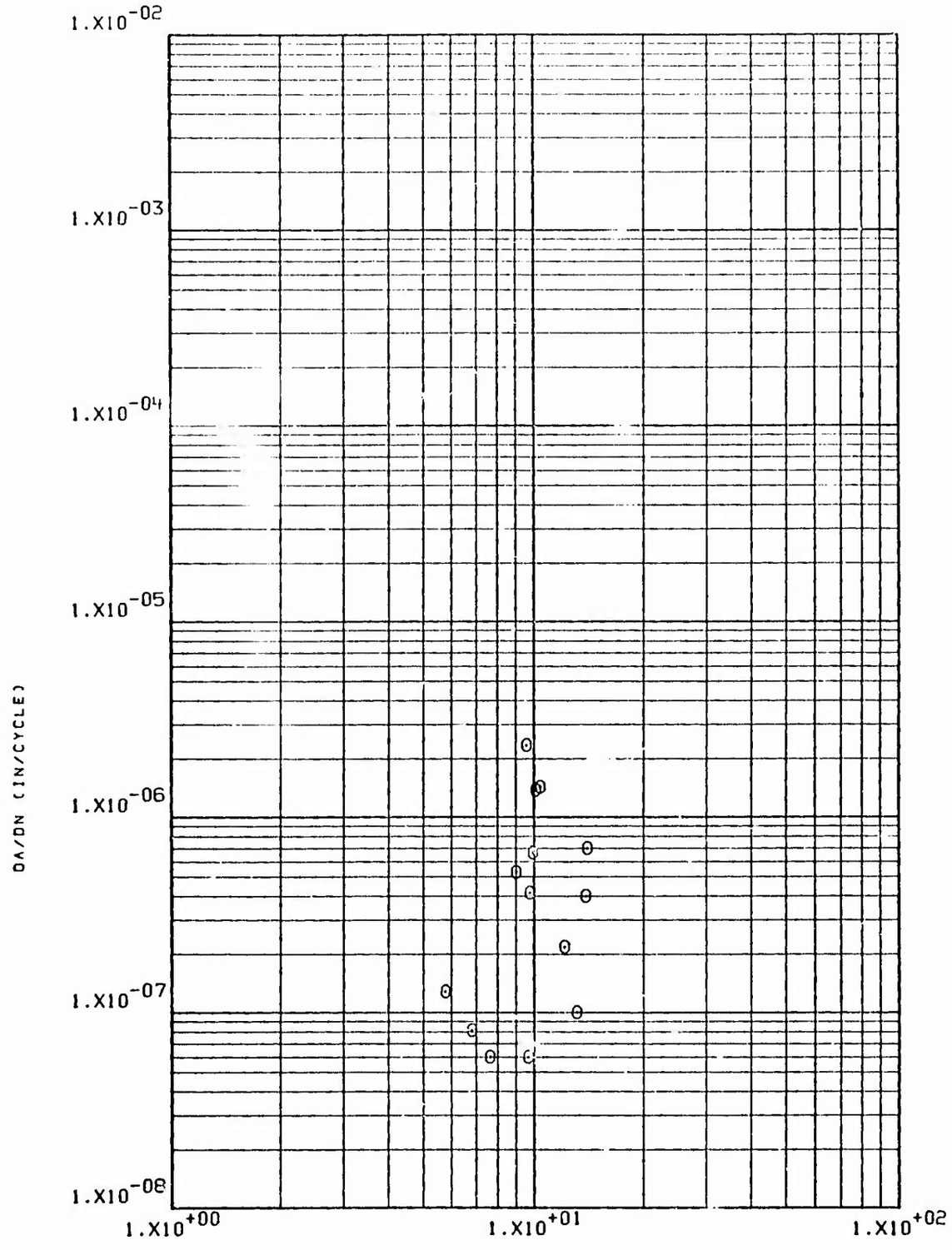
27 NRW 75-15 2024-T852 LHA RT R=.5 360CPM



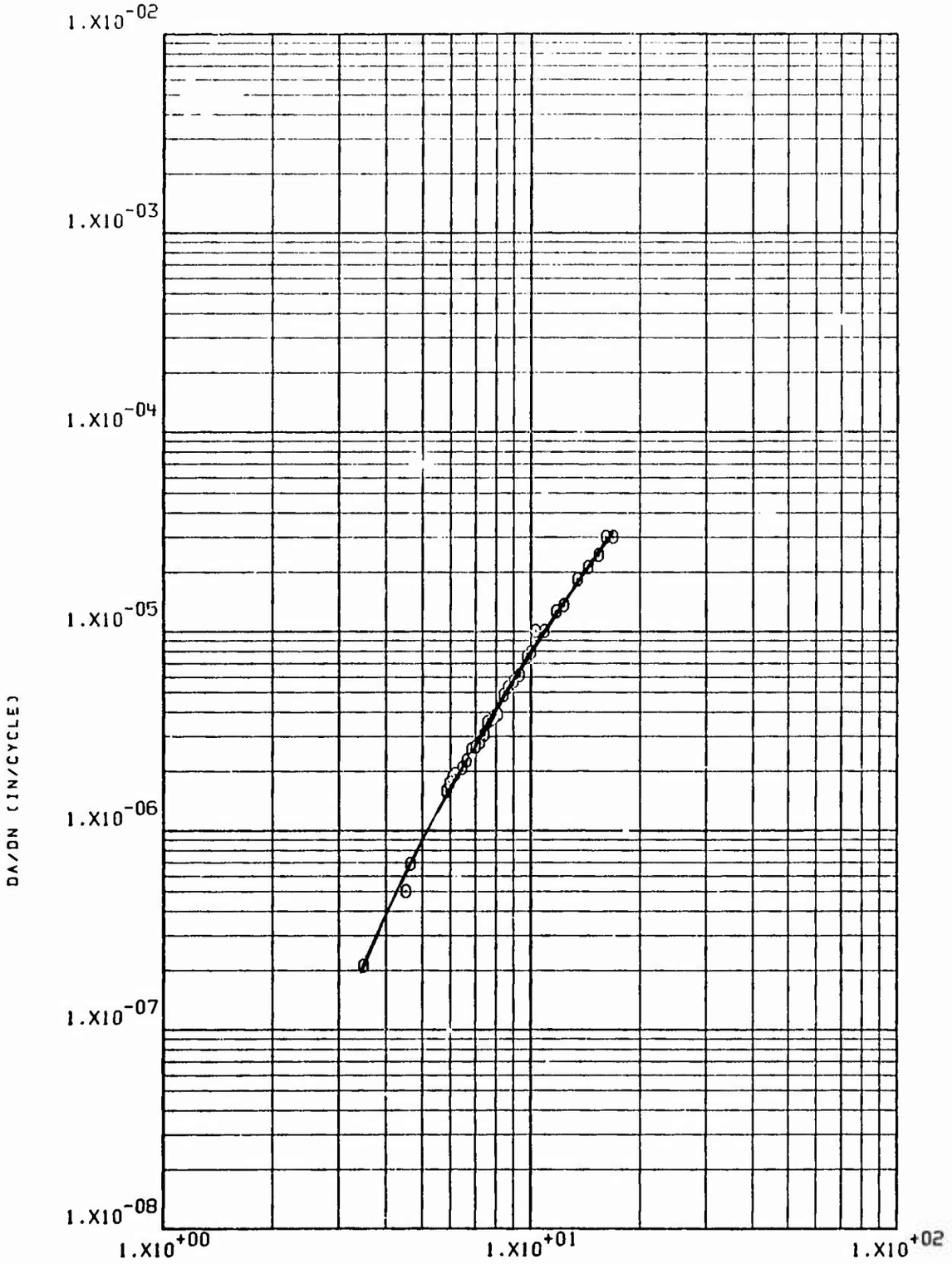
27 NRW 75-16 2024-T852 LHA RT R=.3 360CPH



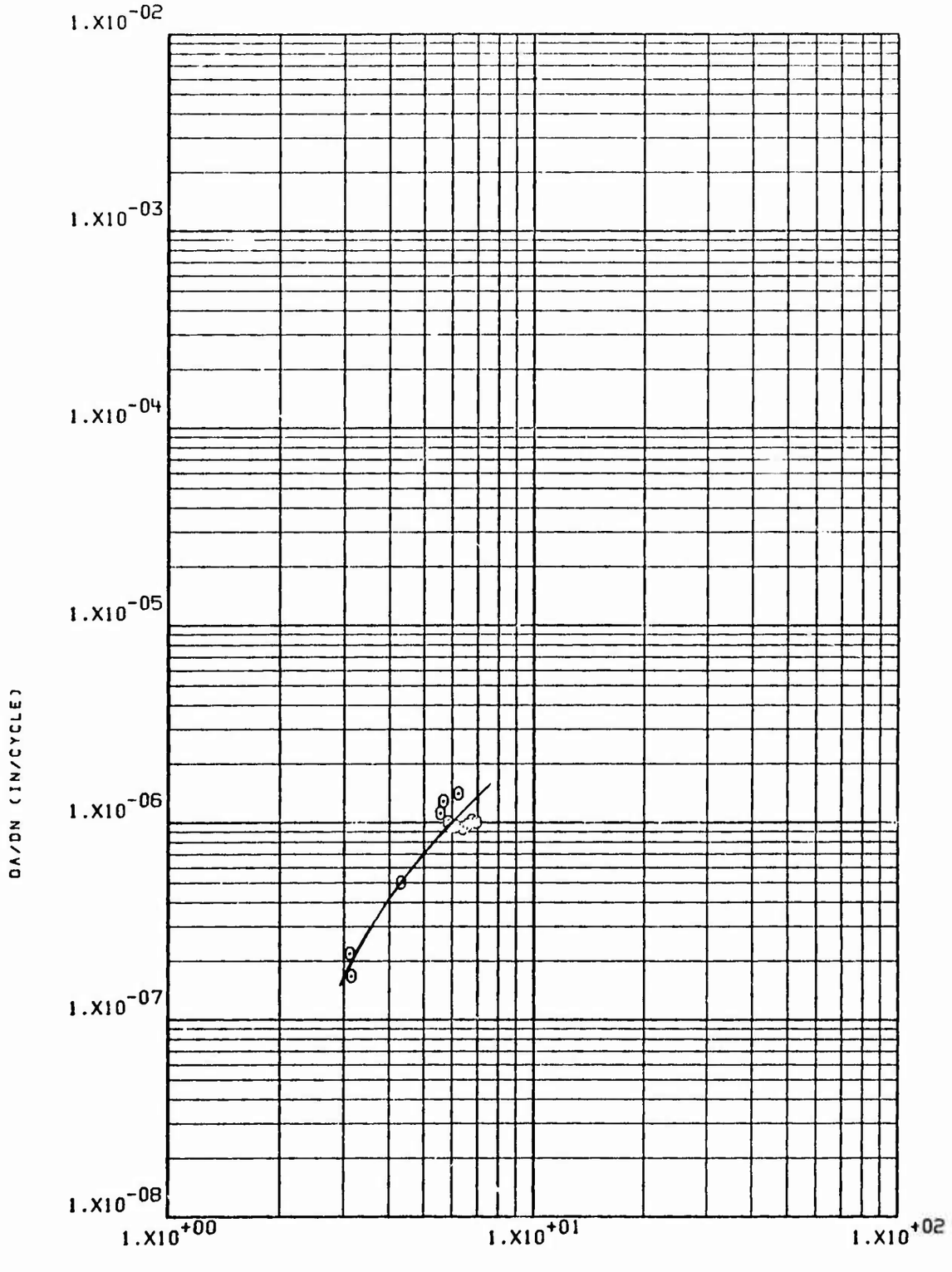
27 NRW 75-17 2024-T852 STW RT R=.5 60CPM



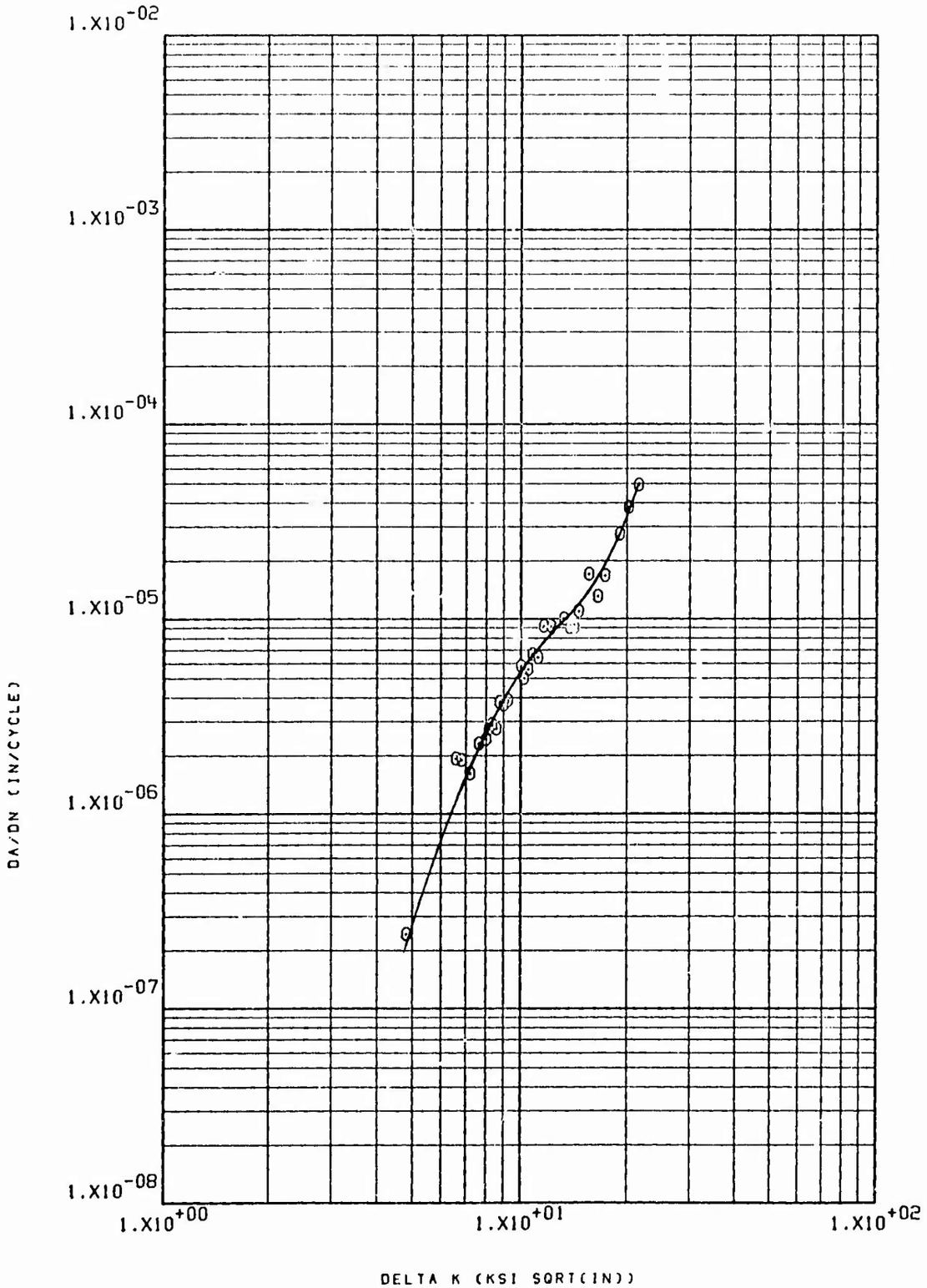
27 NRW 75-51 2024-T852 HAND FORGING ALUM SUMP 150F R=.08 60CPM



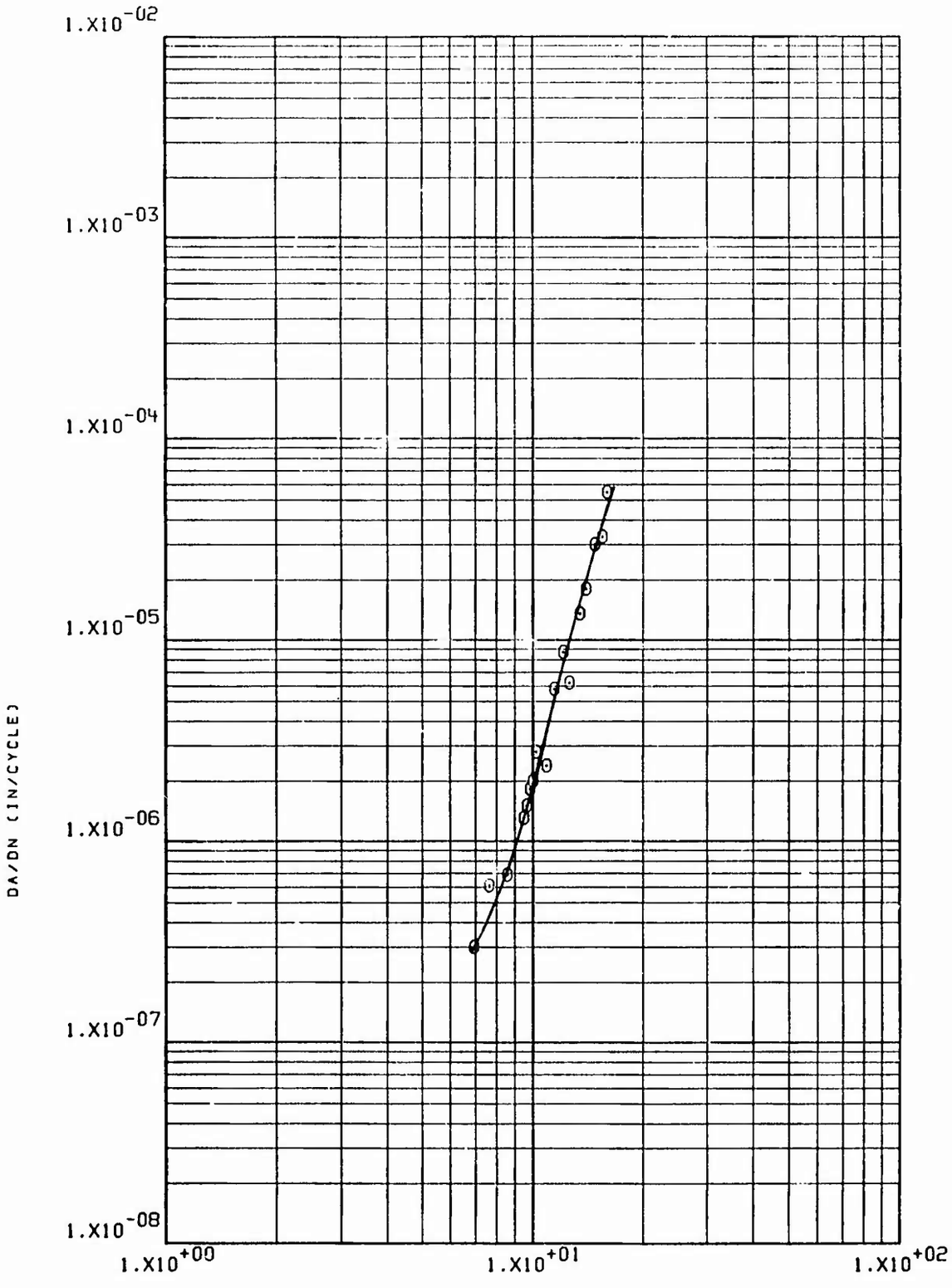
27 NRW 75-52 2024-T852 FORG SHOP CLN SOLV RT R=.08 60CPM



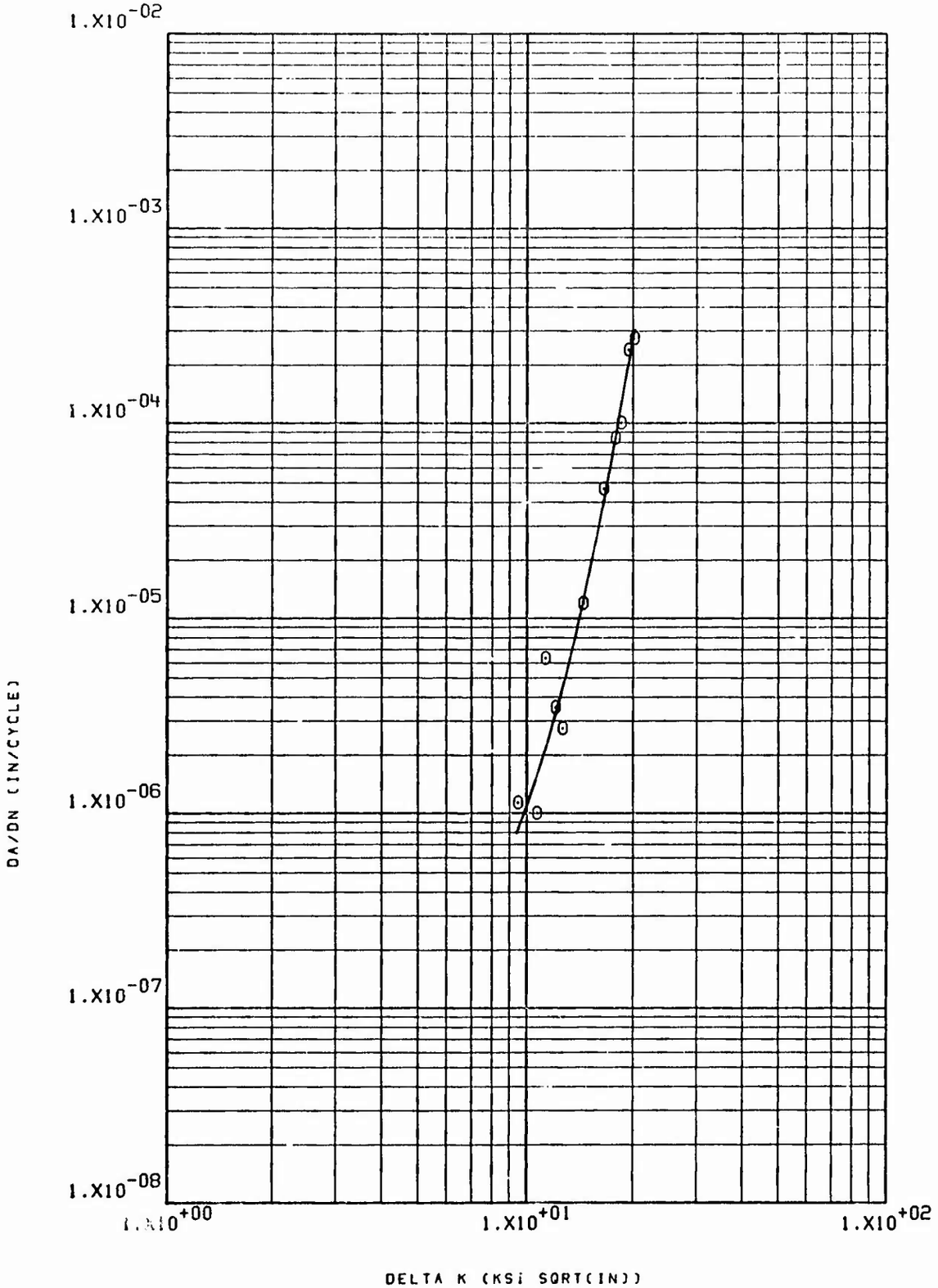
27 NRW 75-53 T852 2024 ALUM HAND FORGING LHA RT R=.7 360CPM



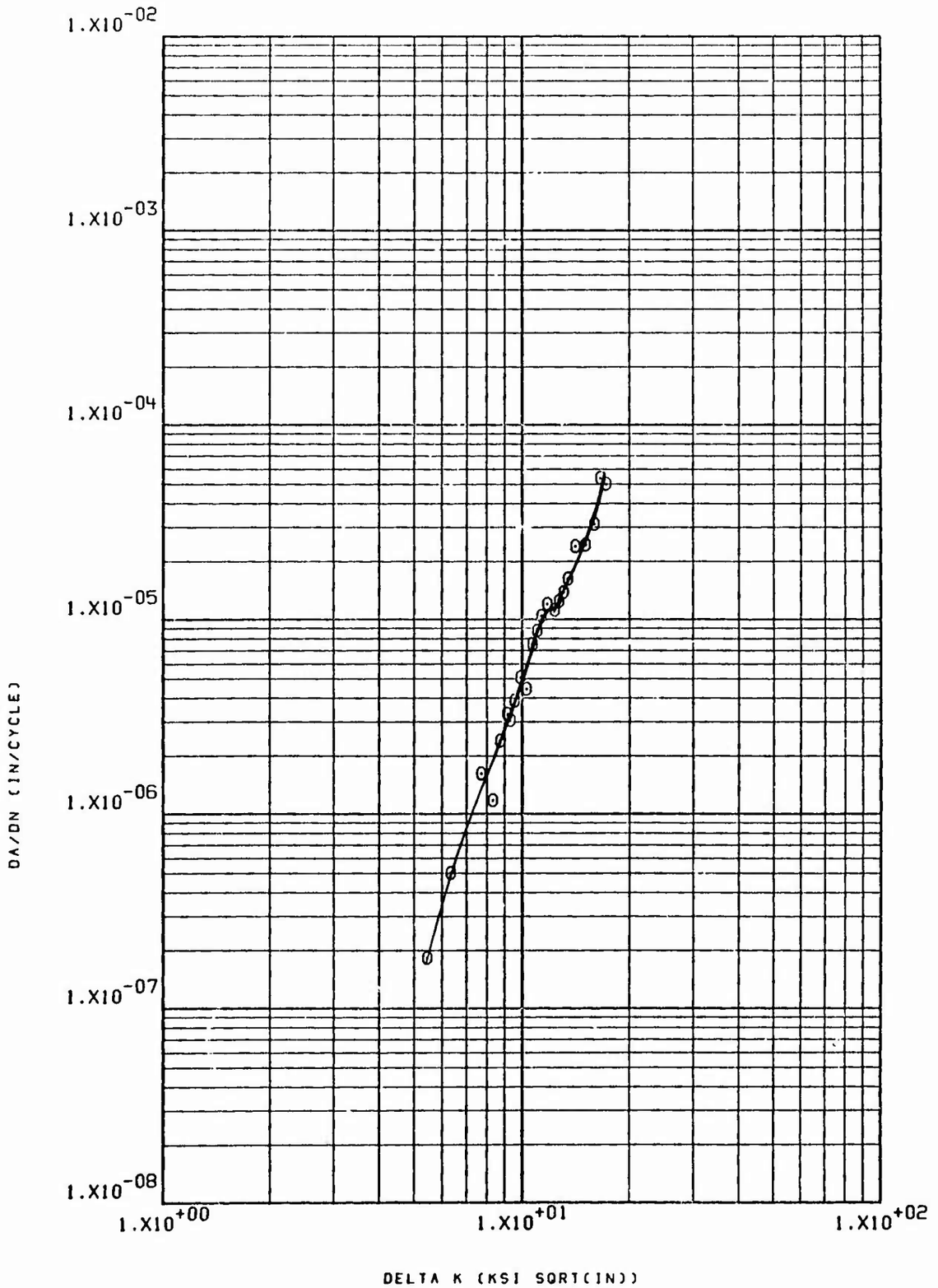
27 NRW 75-54 2024-T852 FORGING LHA 265F 360CPM R=.00



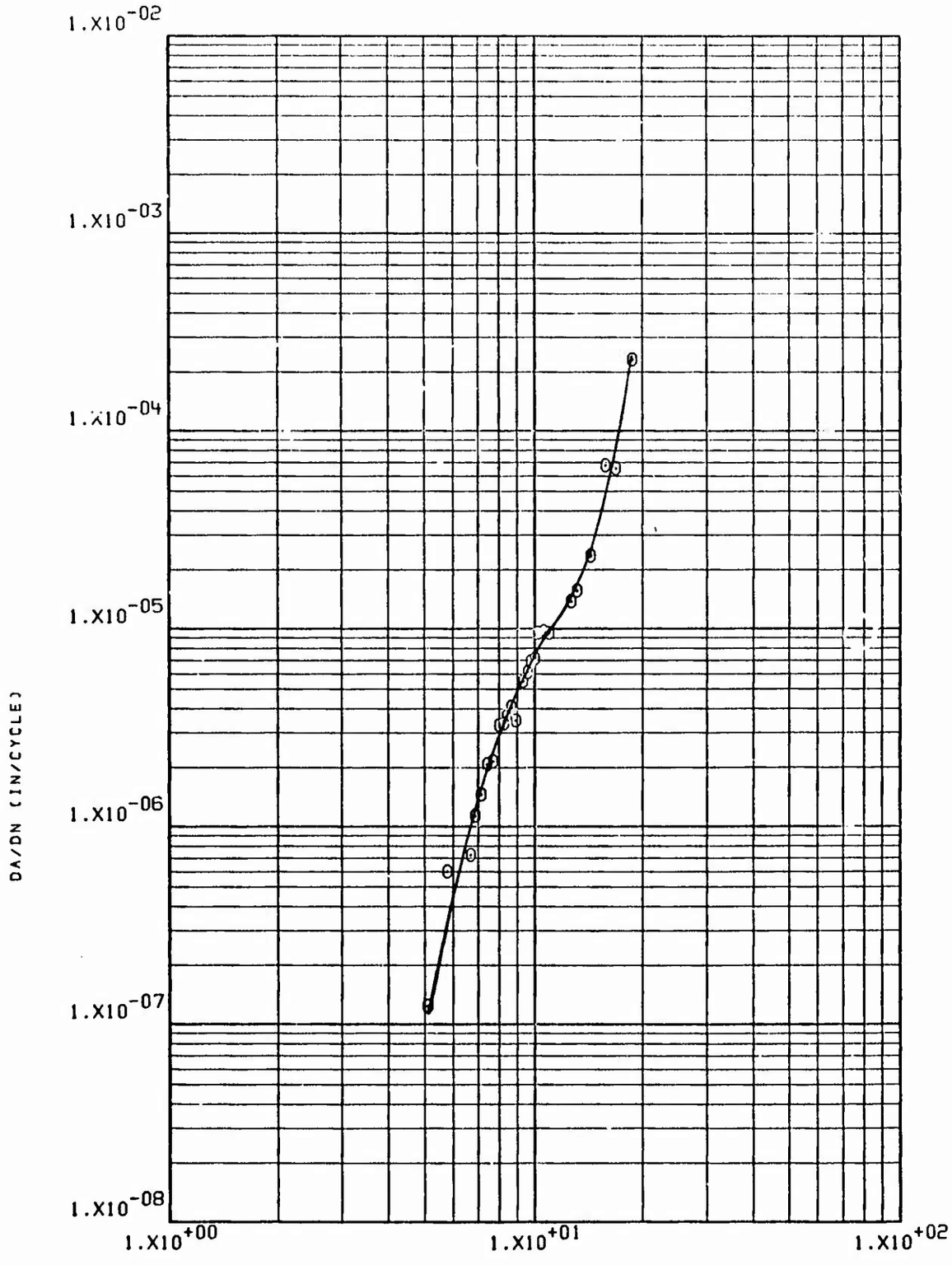
27 NWR 75-55 2024-T852 HAND FORGING ALUM SUMP RT R=.08 60CPM



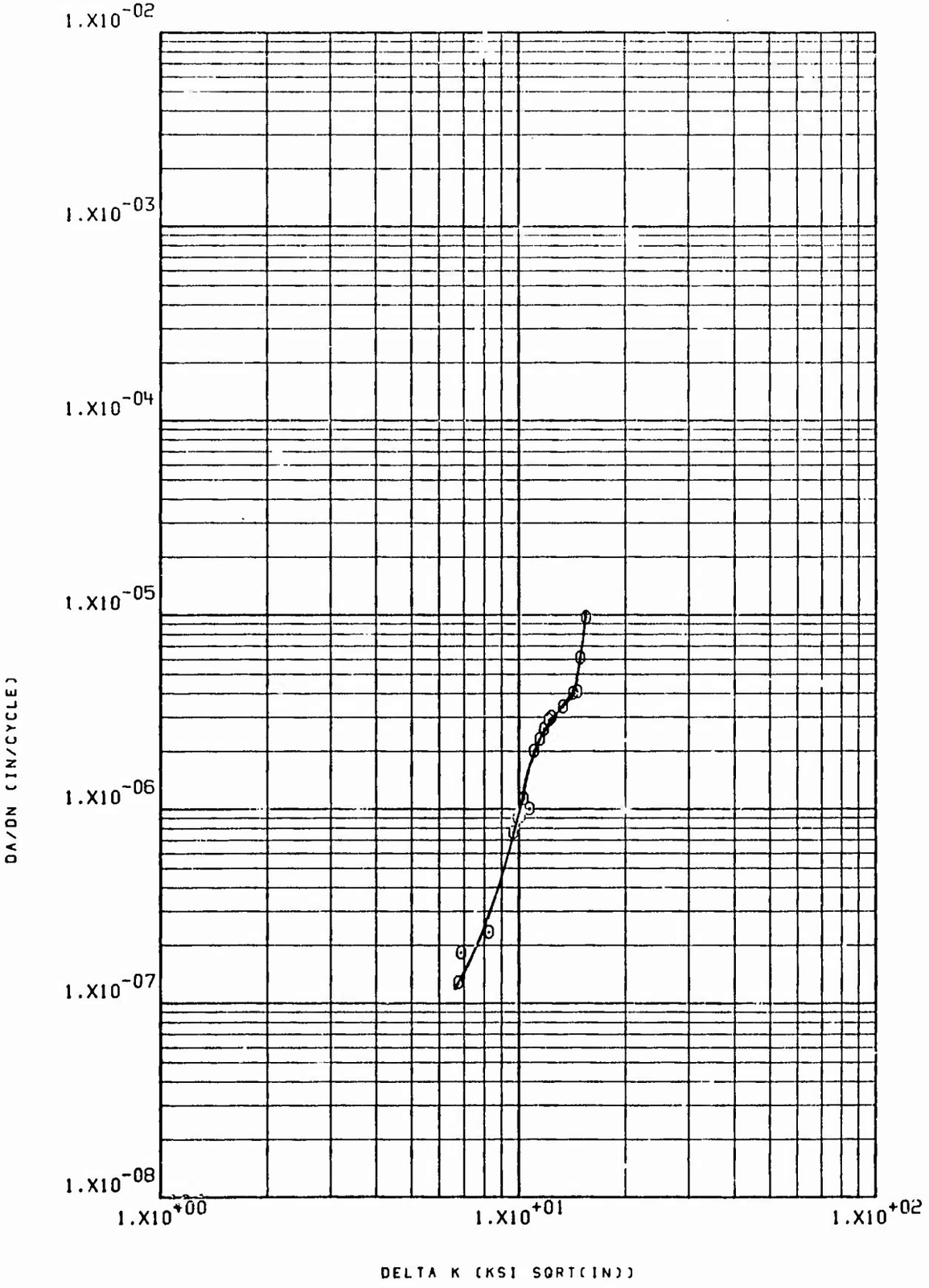
27 NWR 75-56 2024 T852 ALUN HD FORGE SUMP RT R=.08 6CPM



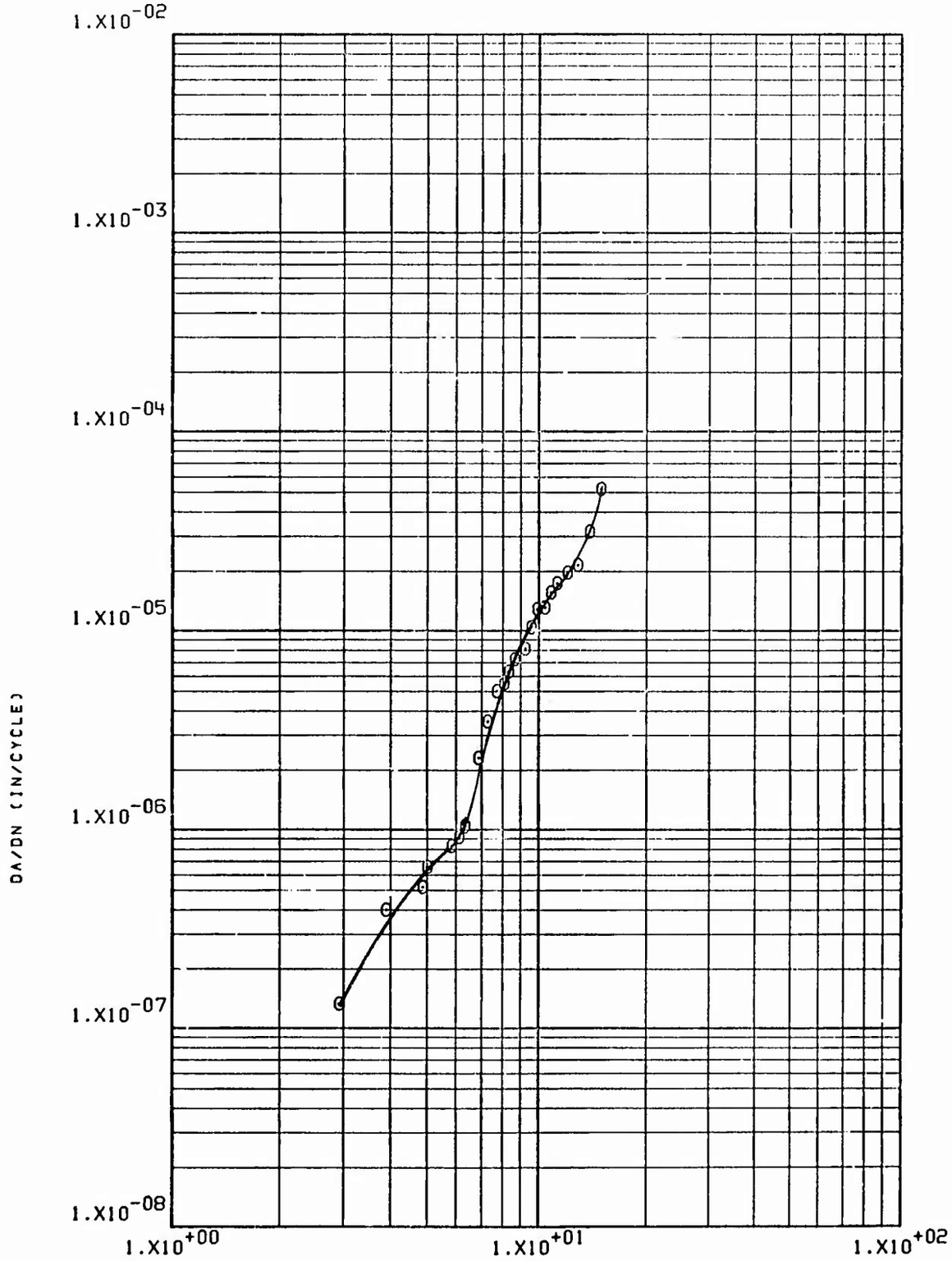
27 NWR 75-57 2024-T852 HAND FORGING ALUM SUMP RT R=.08 60CPM



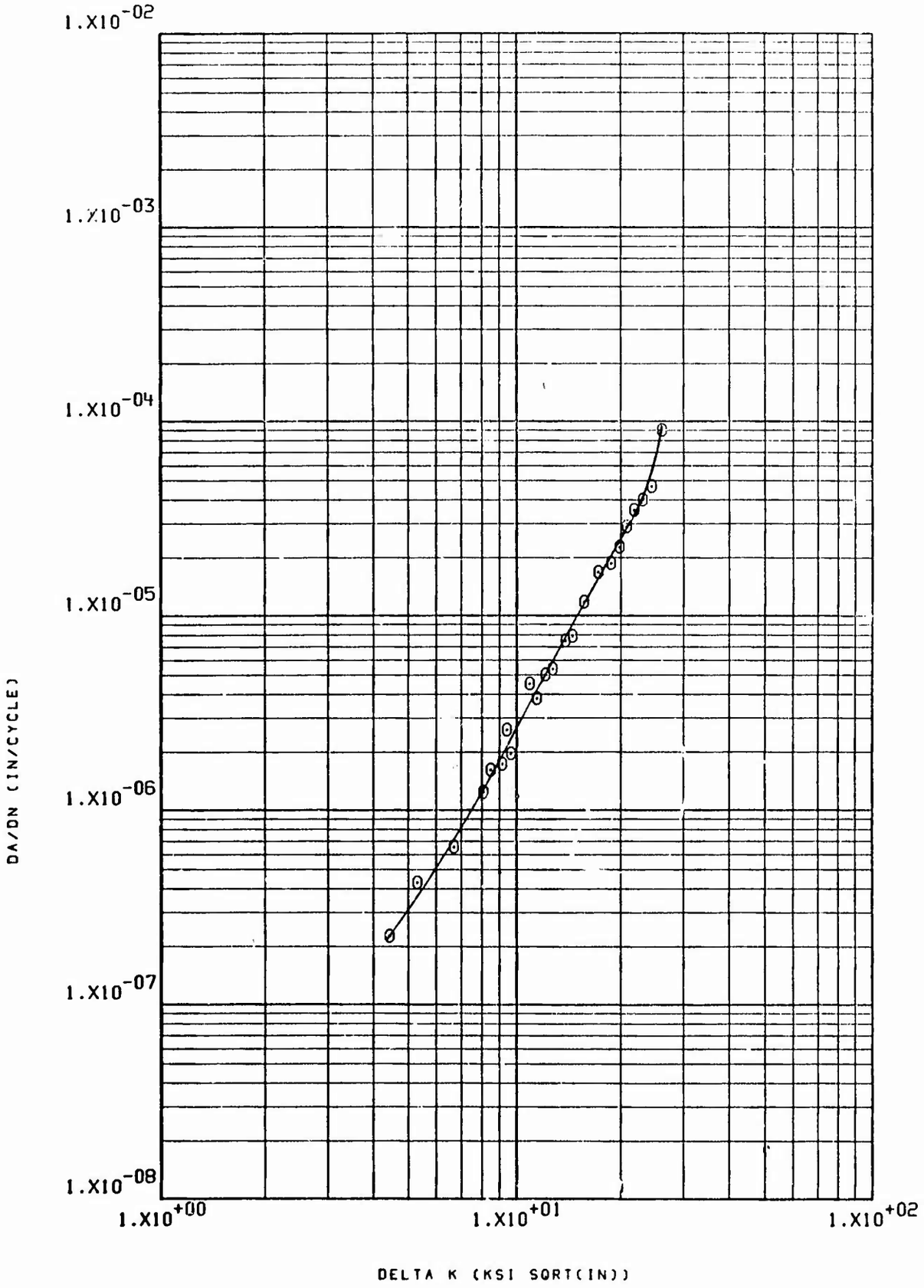
27 NWR 75-58 2024-T852 HAND FORGING ALUM LHA 265F R=.08 360CPM



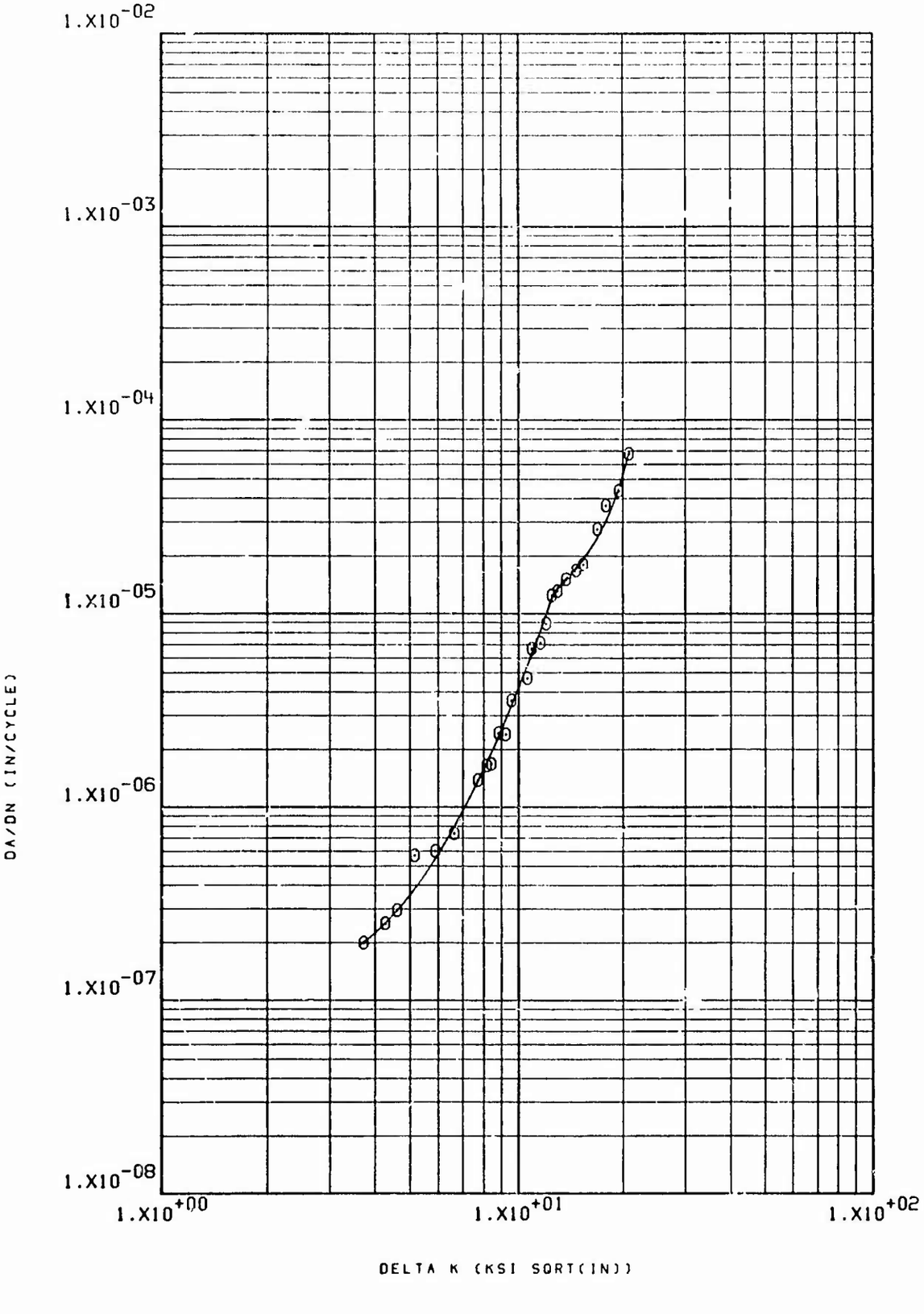
27 NWR 75-59 2024-T852 FORGING LHA RT R=.08 360CPM



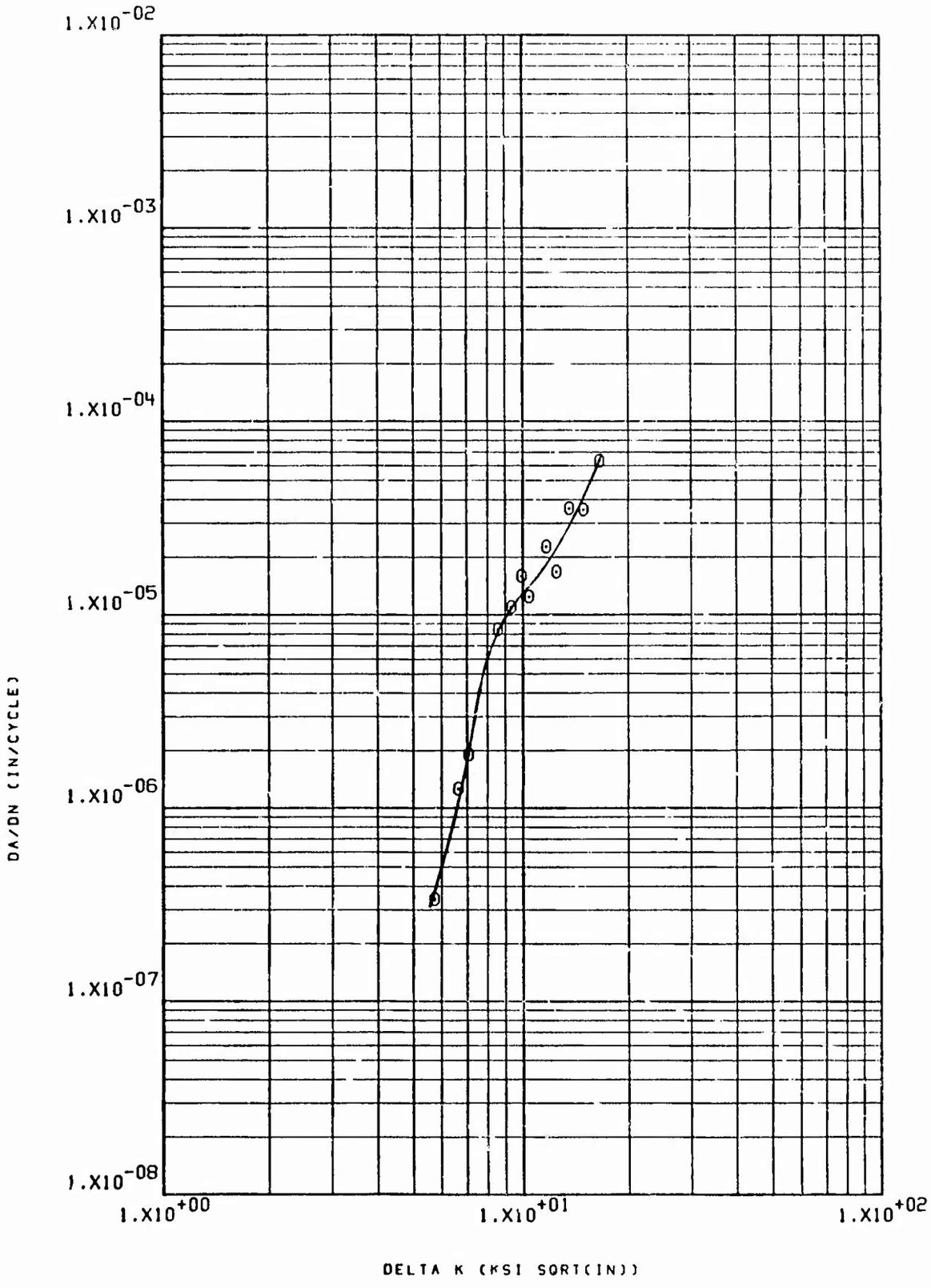
28 NRW 80-22 7050-T-73651 ALUM LHA RT R=.5 360CPM



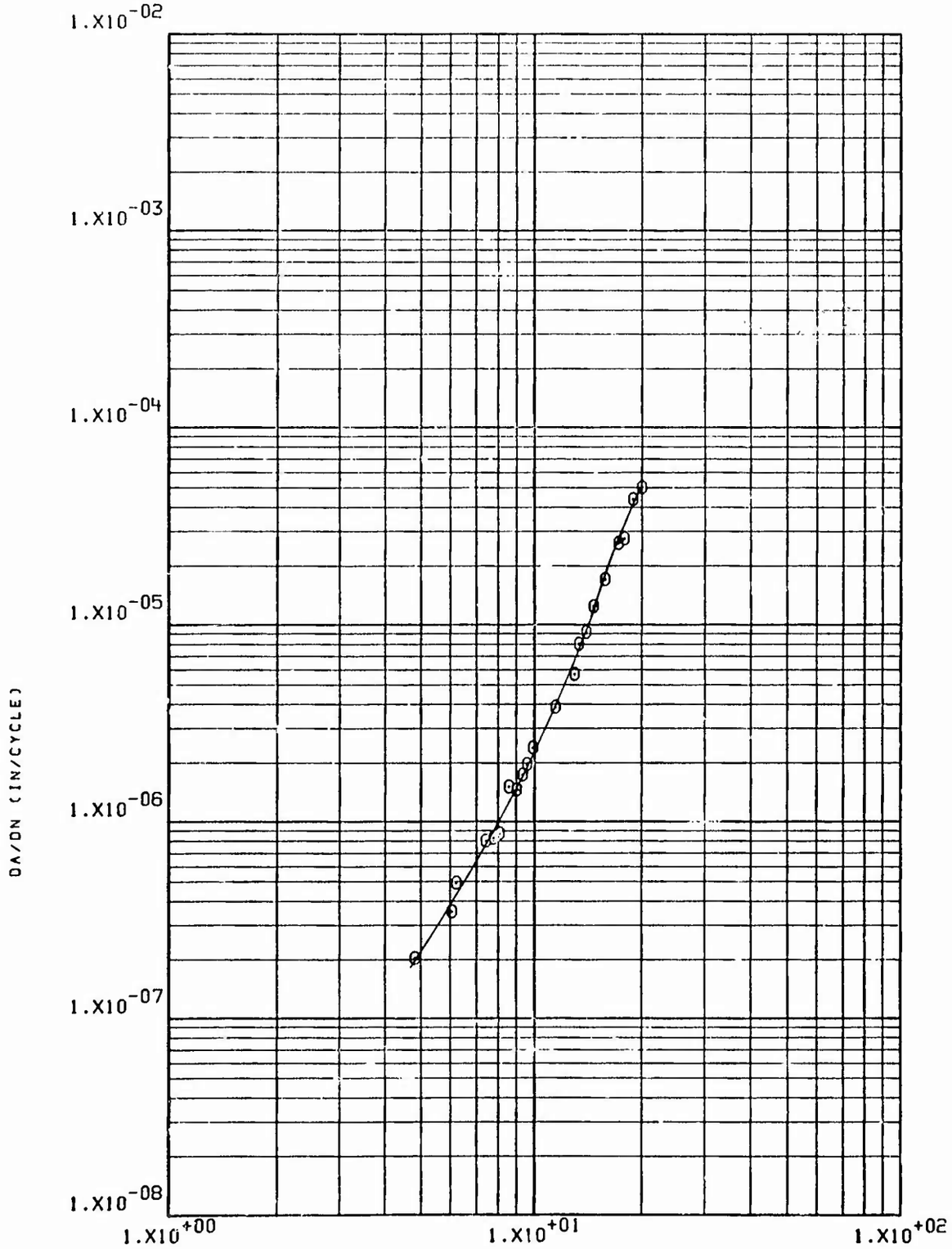
28 NRW 80-23 7050-T73651 ALUM LHA RT R=.08 360CPM



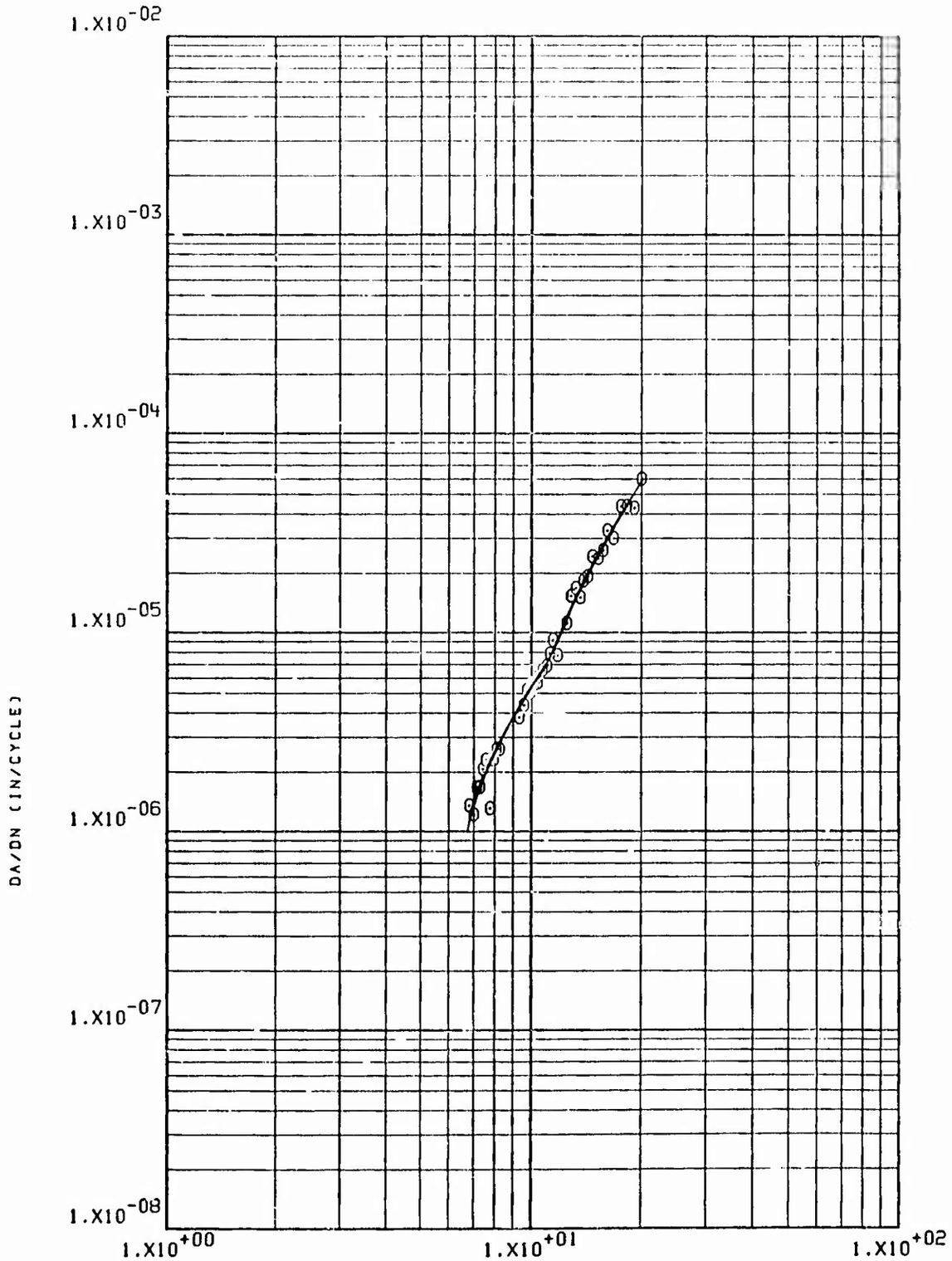
28 NRW 80-24 7050-T73651 ALUM LHA RT R=.3 360CPM



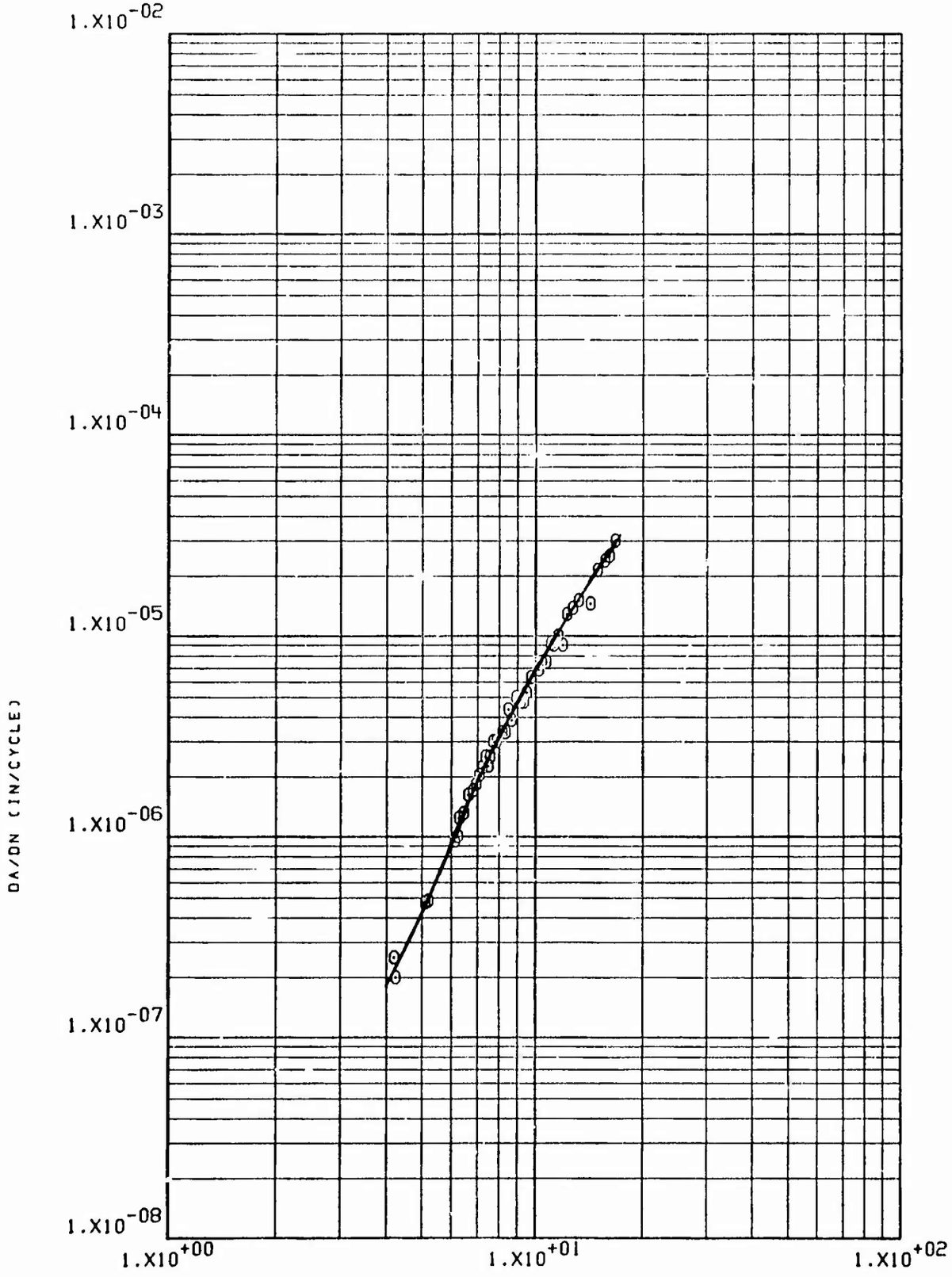
28 NWR 80-25 7050 T73651 SUMP RT 60CPM R=.08



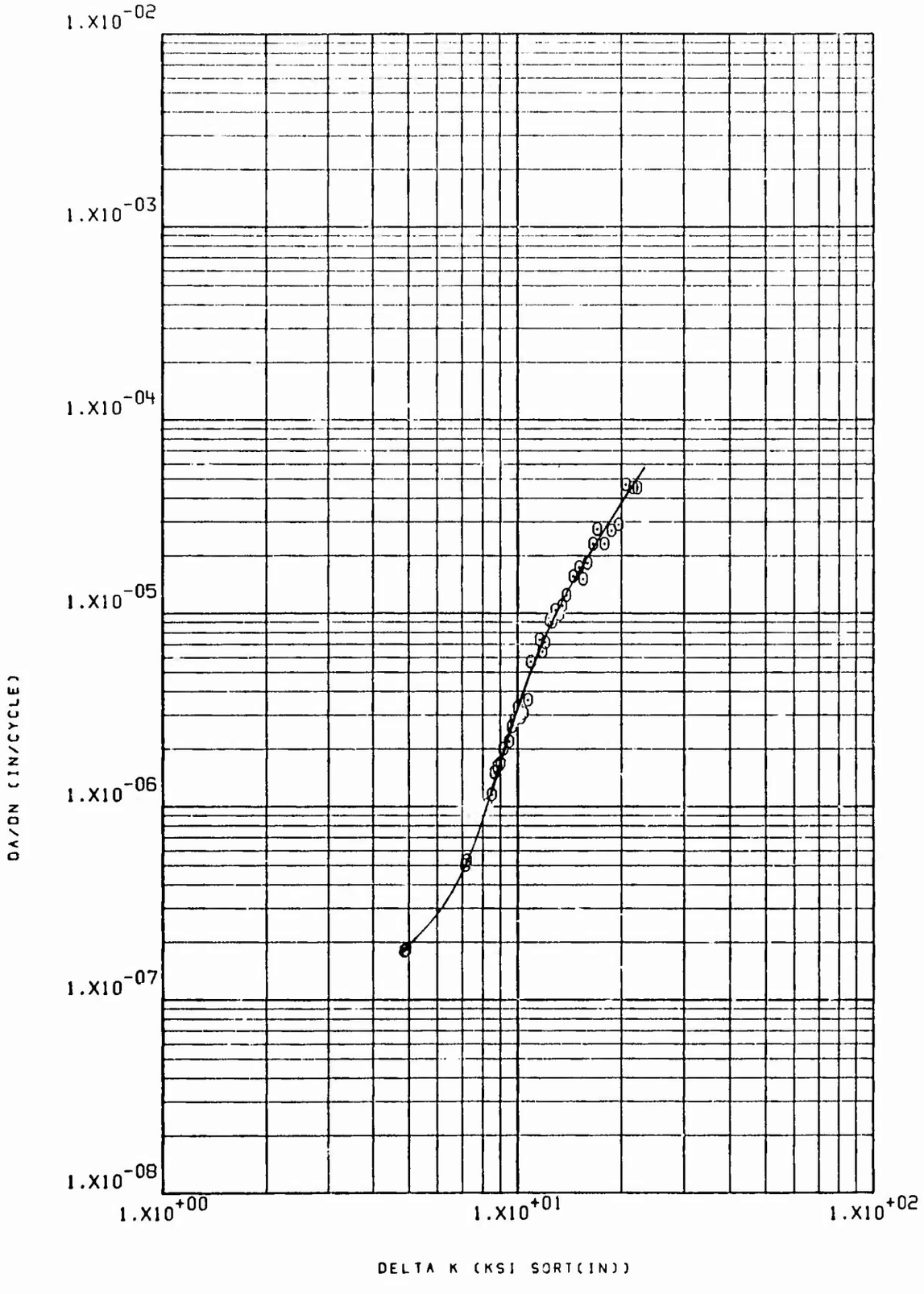
28 NWR 80-26 7050-T7365I ALUM LHA RT R=.08 360CPM



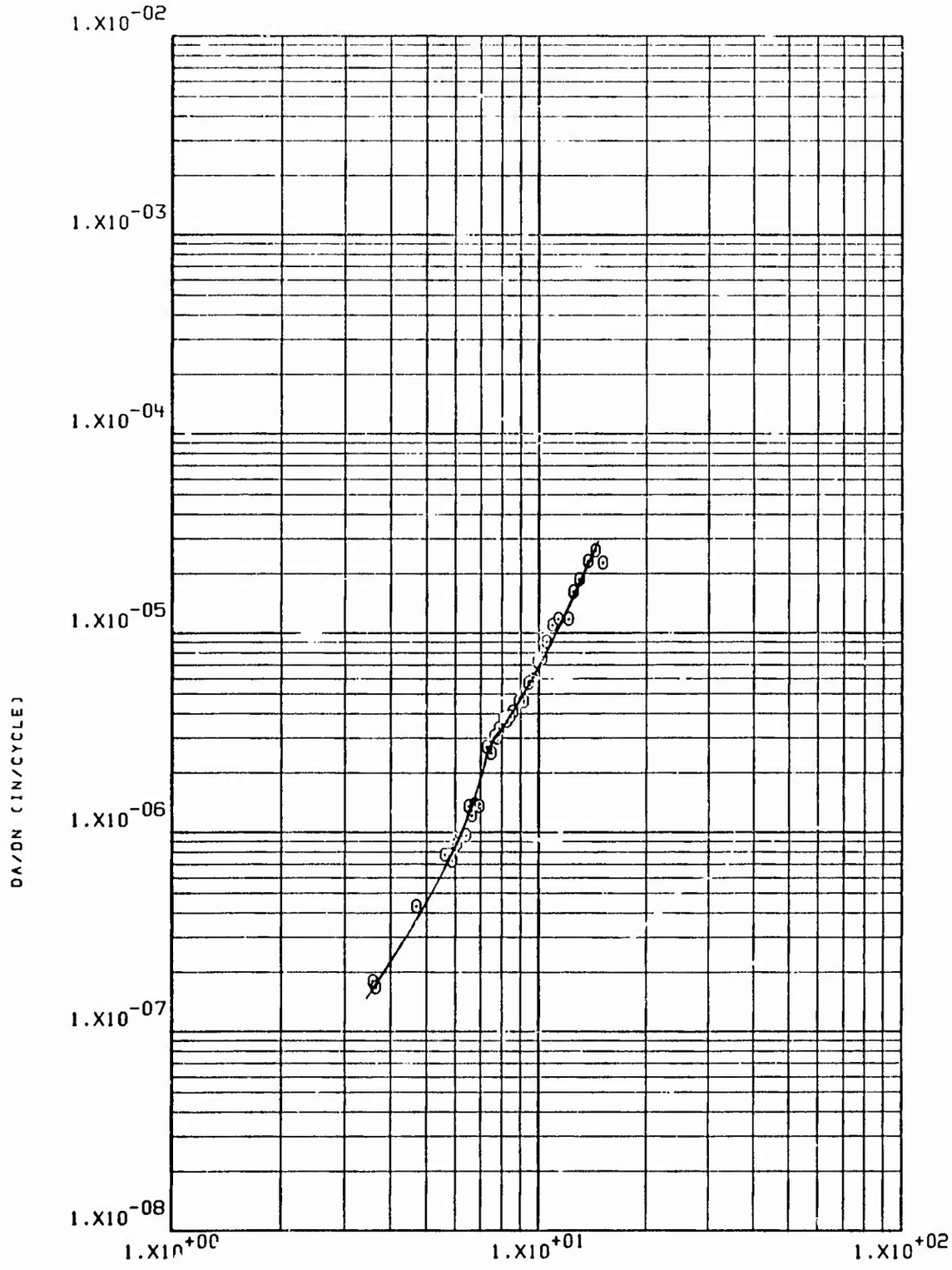
29 NRW 83-1 7075-T73511 LHA RT R=.08 6CPM



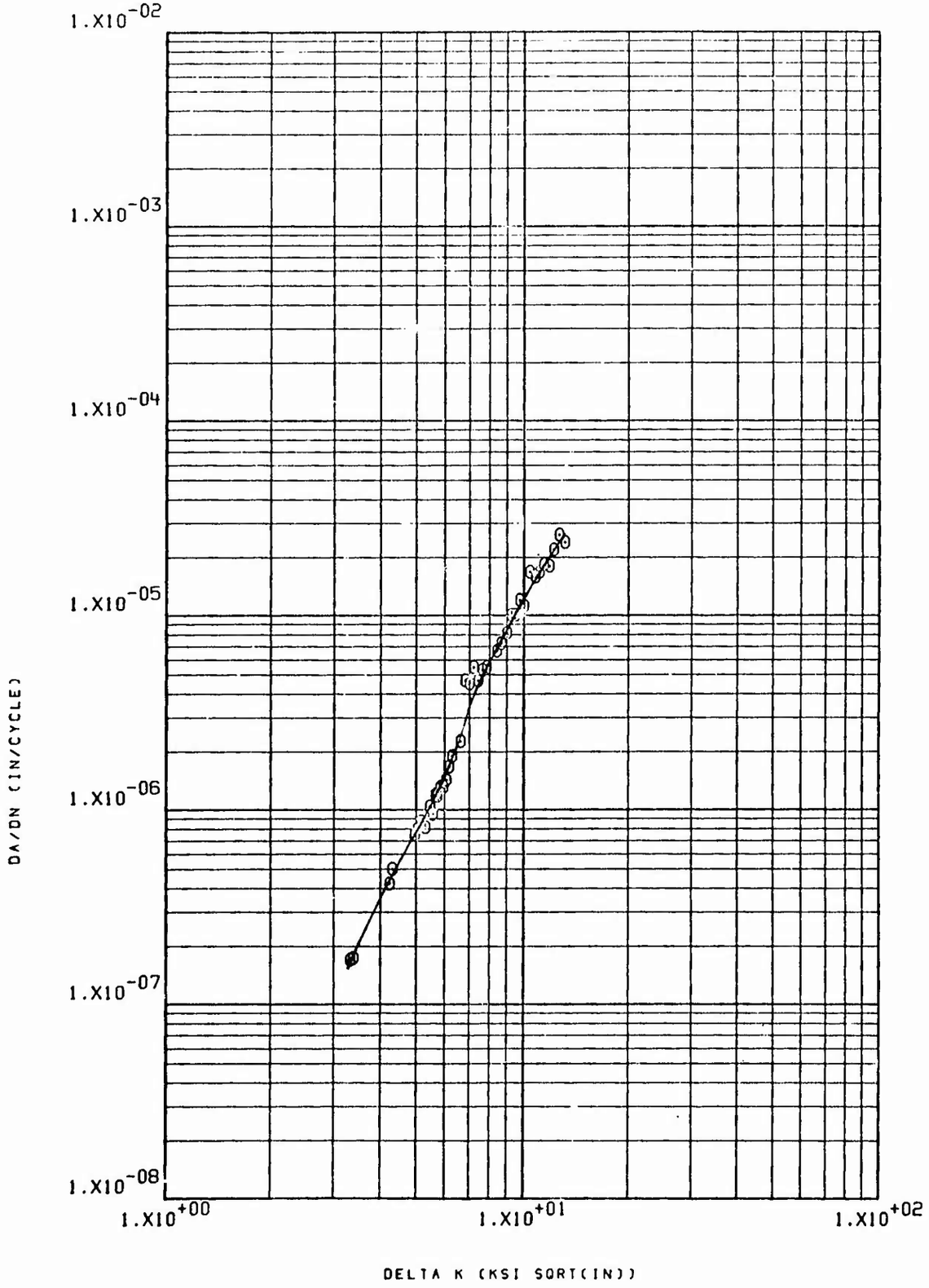
29 NRW 83-2 7075-T73511 LHA RT R=.08 60CPM



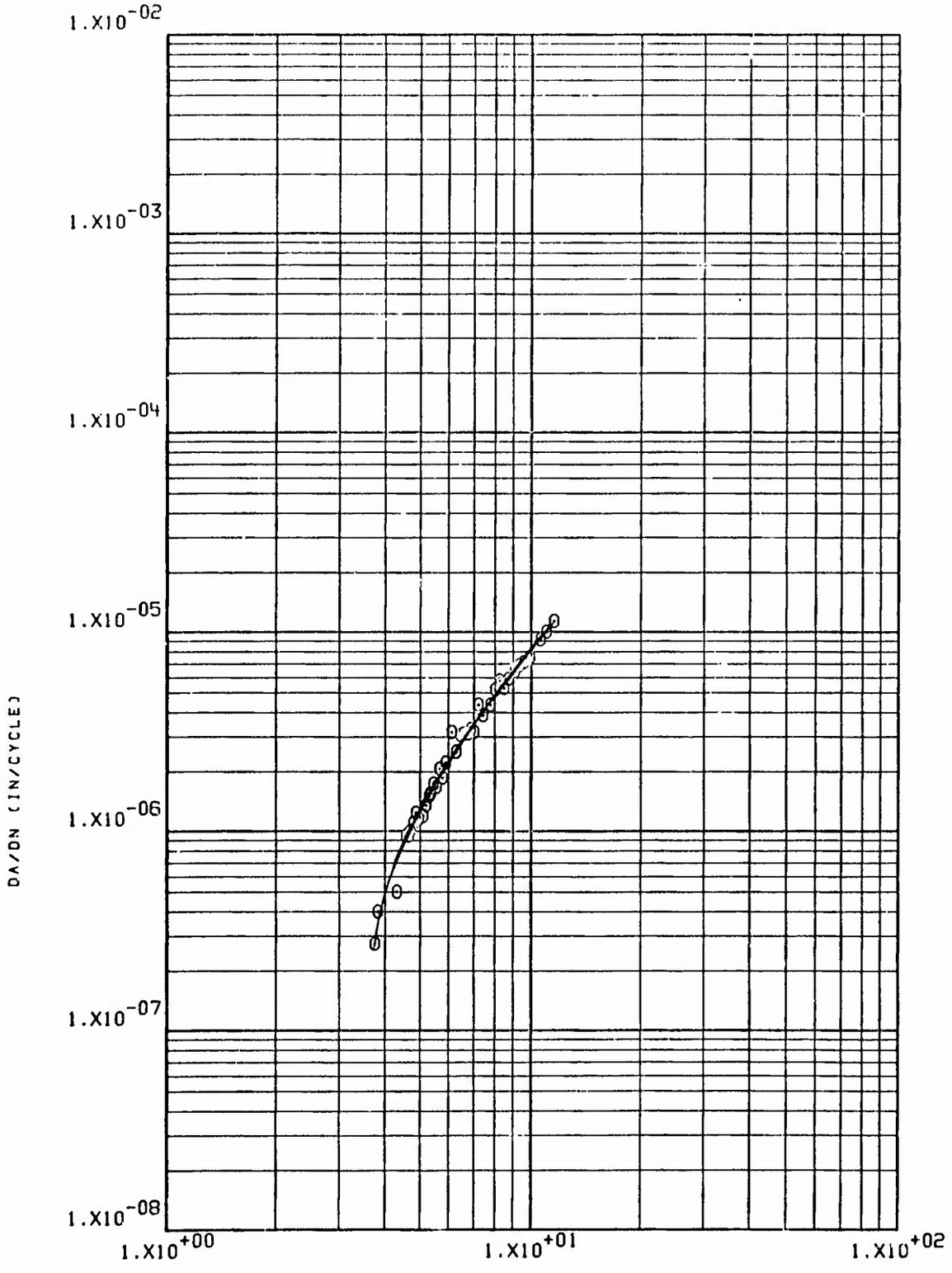
29 NRW 83-3 7075-T73511 LHA R1 R=.08 360CPM



29 NRW 83-4 7075-T73511 EXTR L.H.A. R.T. 360CPM R=.3



29 NRW 83-5 7075-T73511 LHA RT R=.5 360CPM



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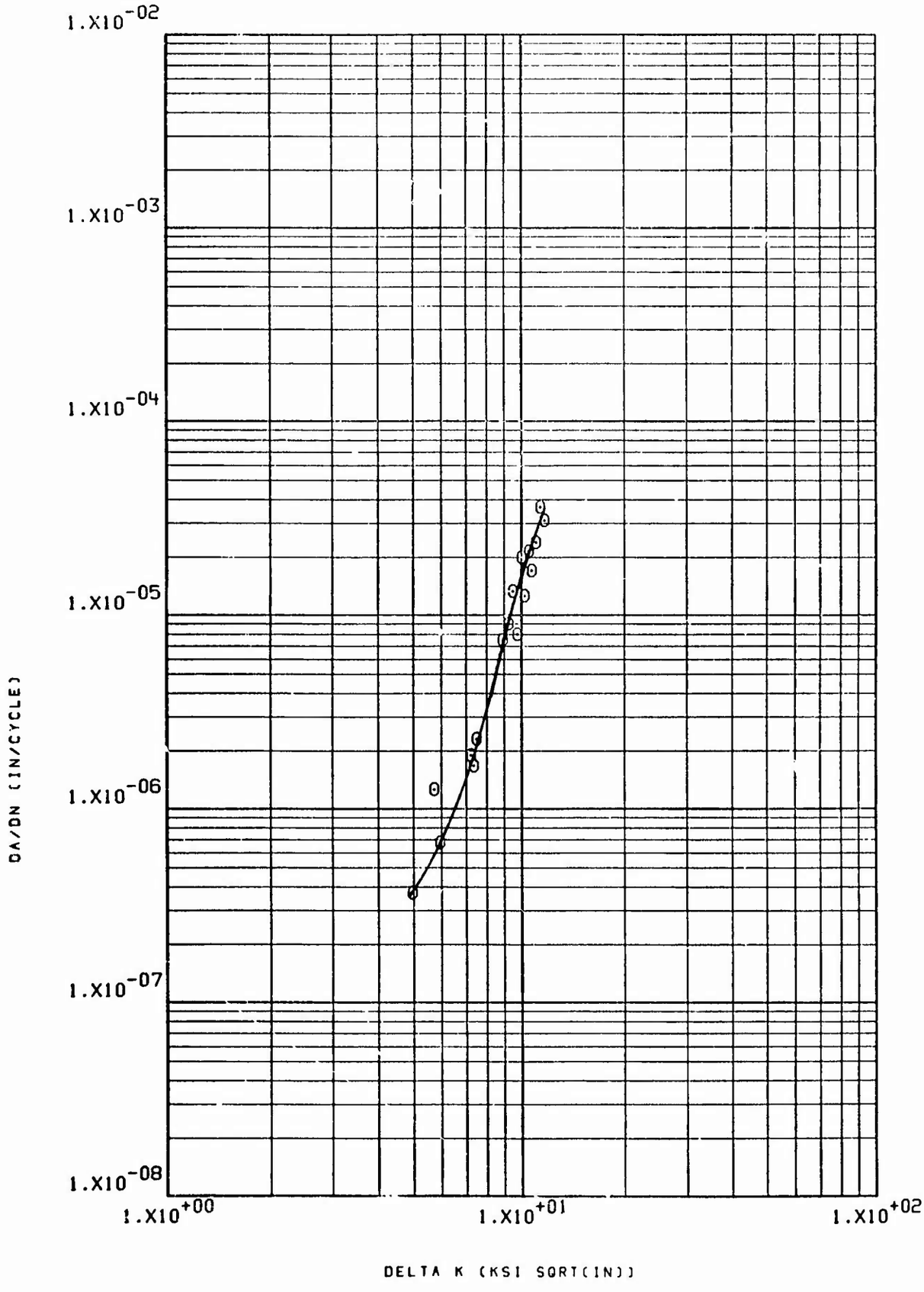
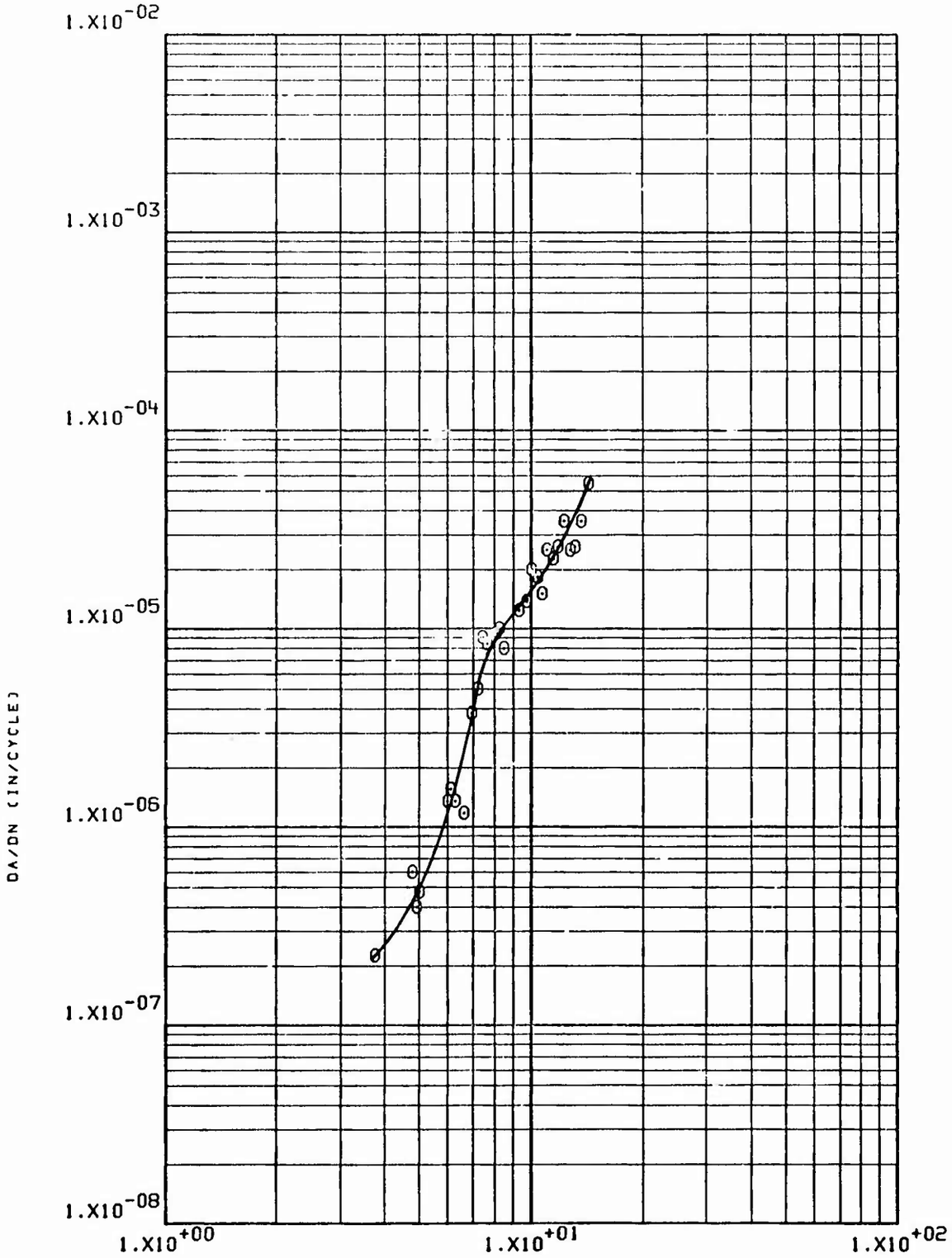
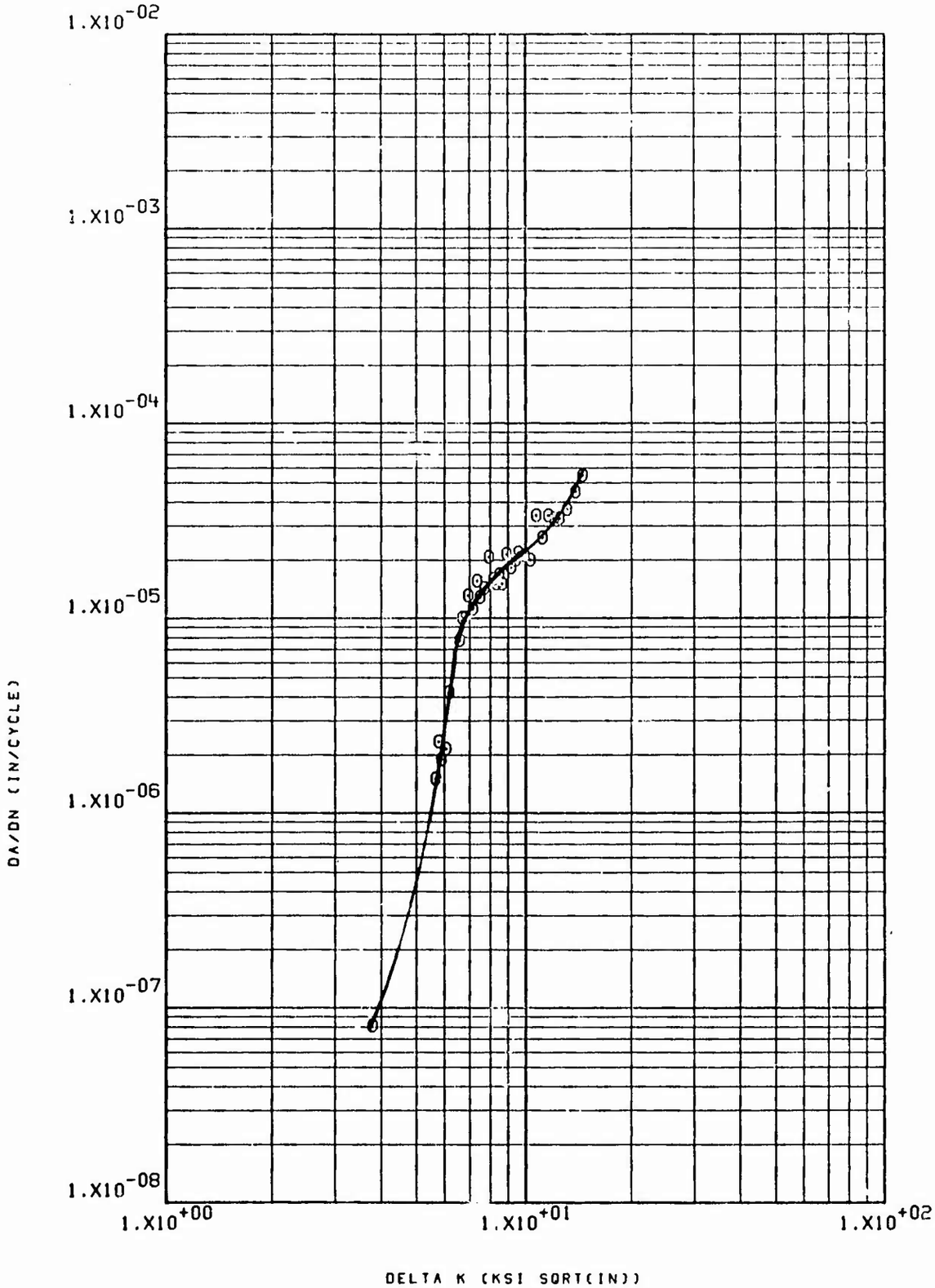


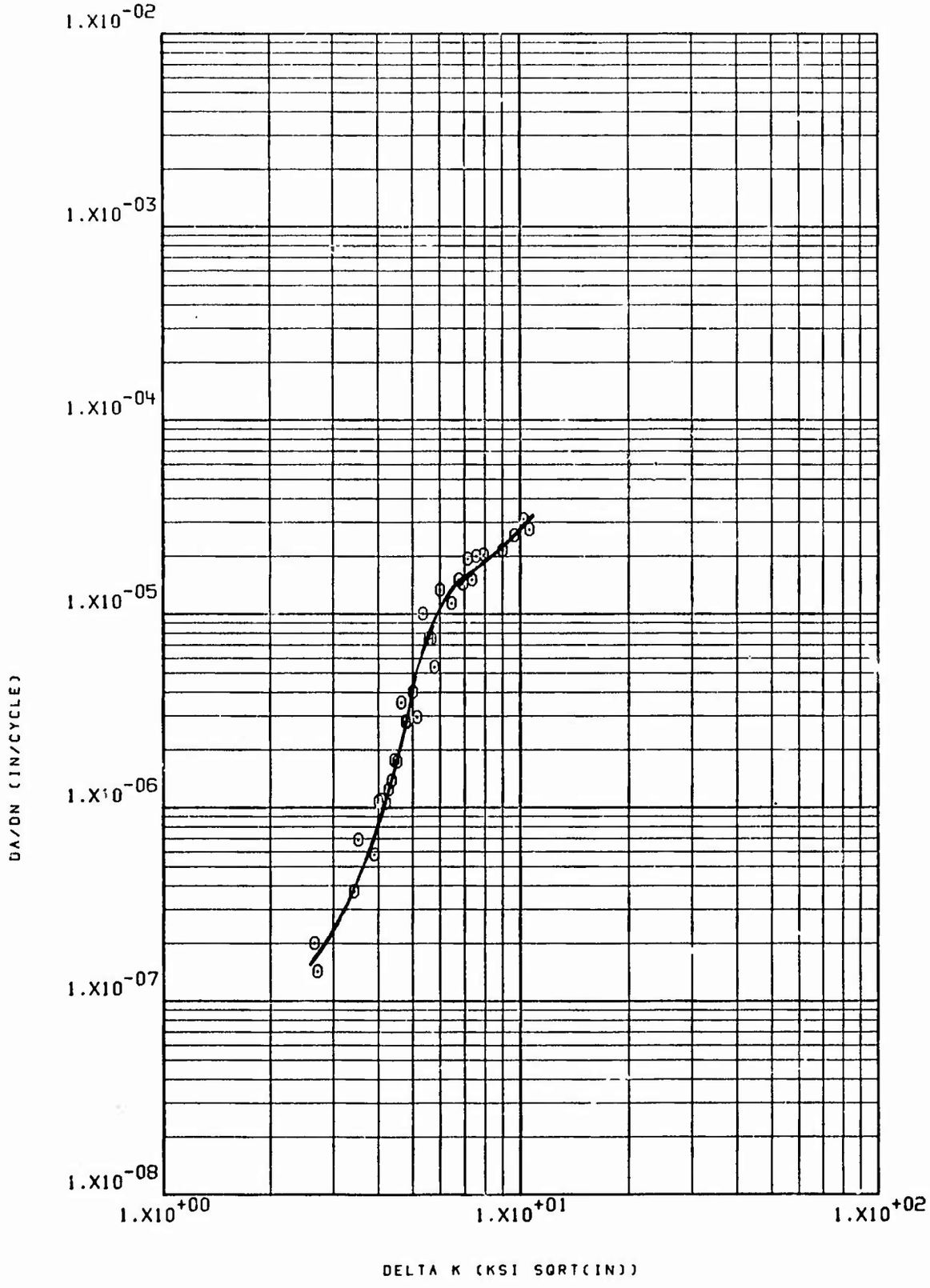
29 NRW 83-7 7075-T73511 STW RT R=.08 6CPM



29 NRW 83-8 7075-T73511 SUMP RT R=.08 60CPM



29 NRW 83-9 173511 7075 ALUM EXTRUSION SUMP RT R=.3 60CPM



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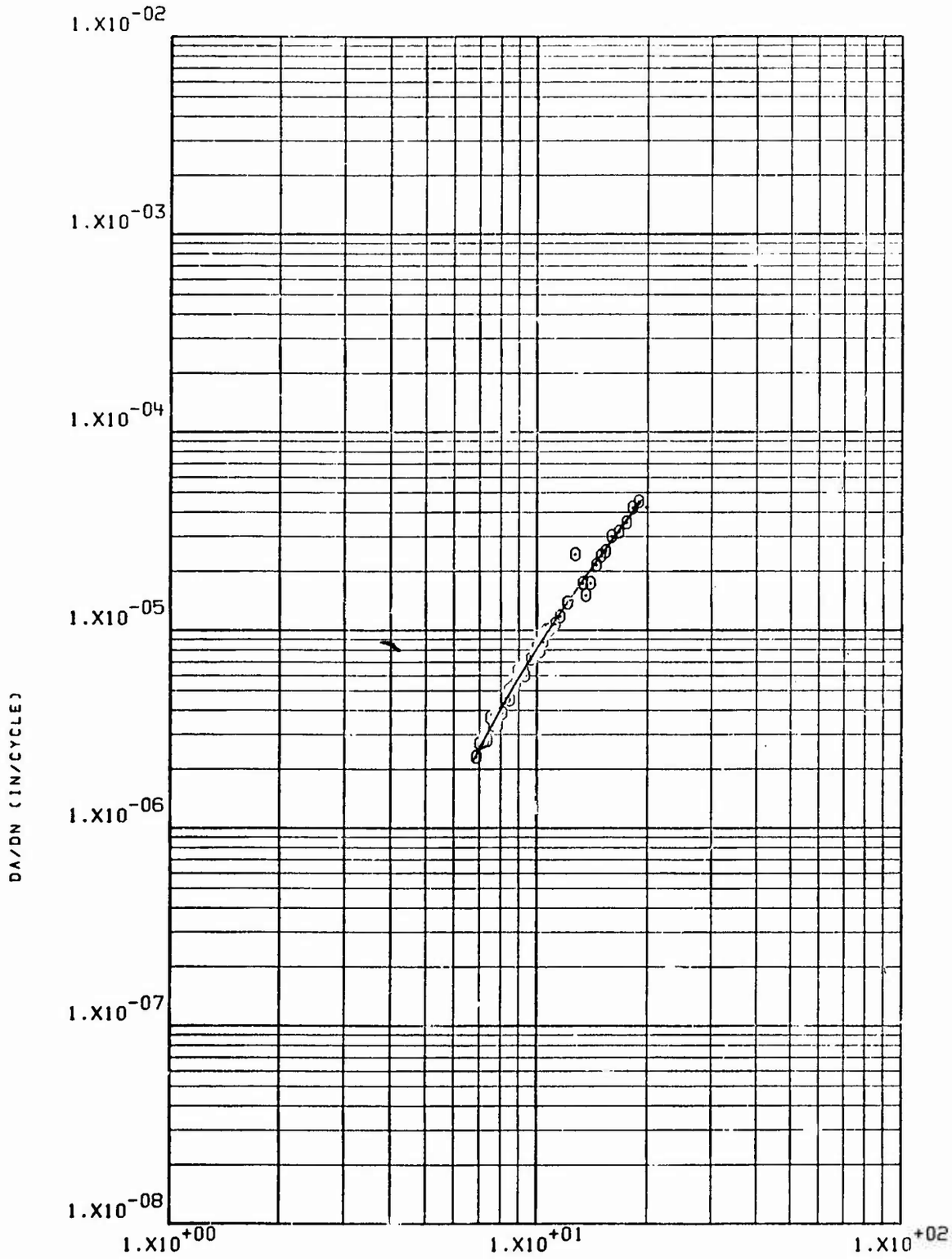
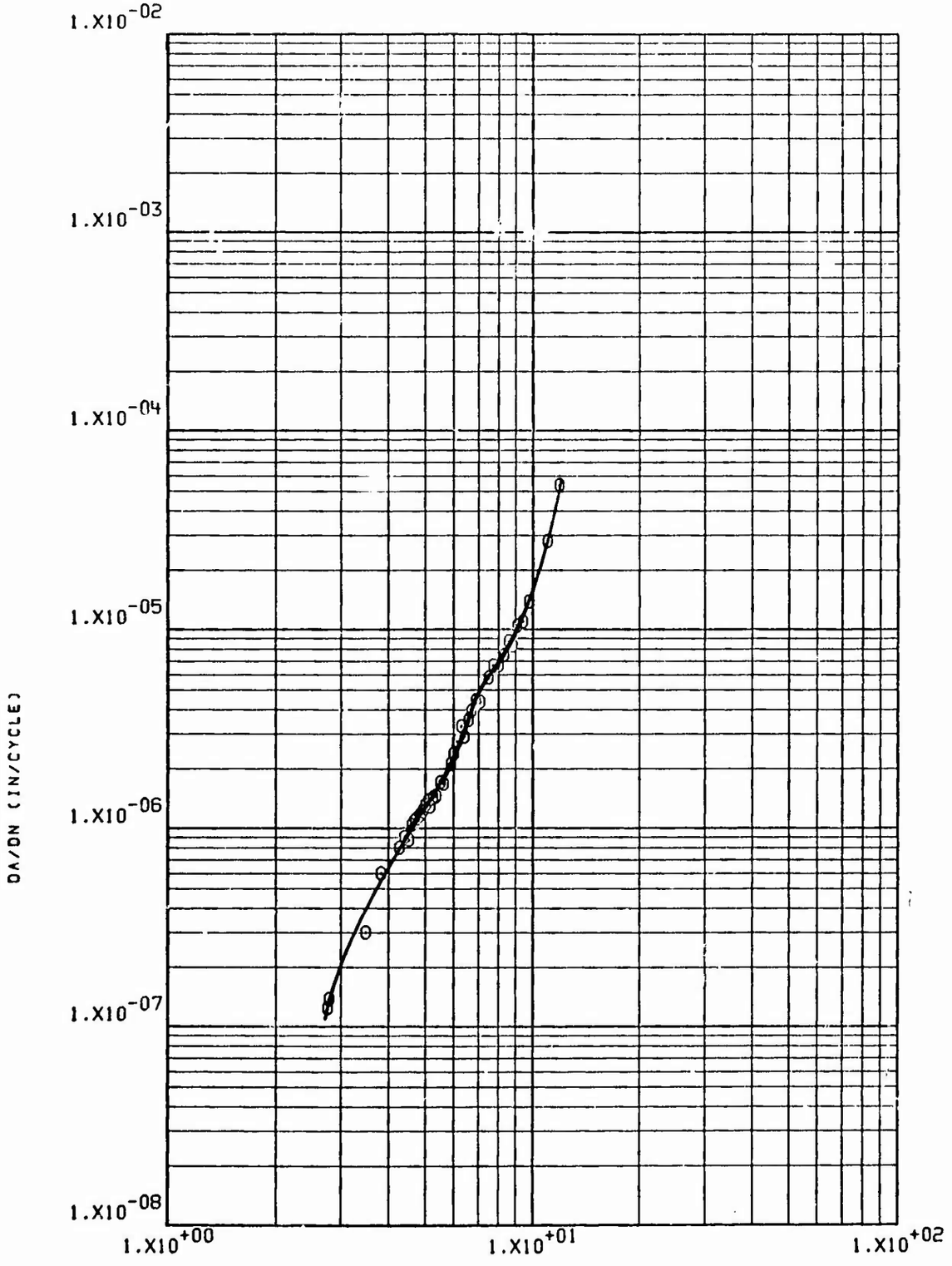
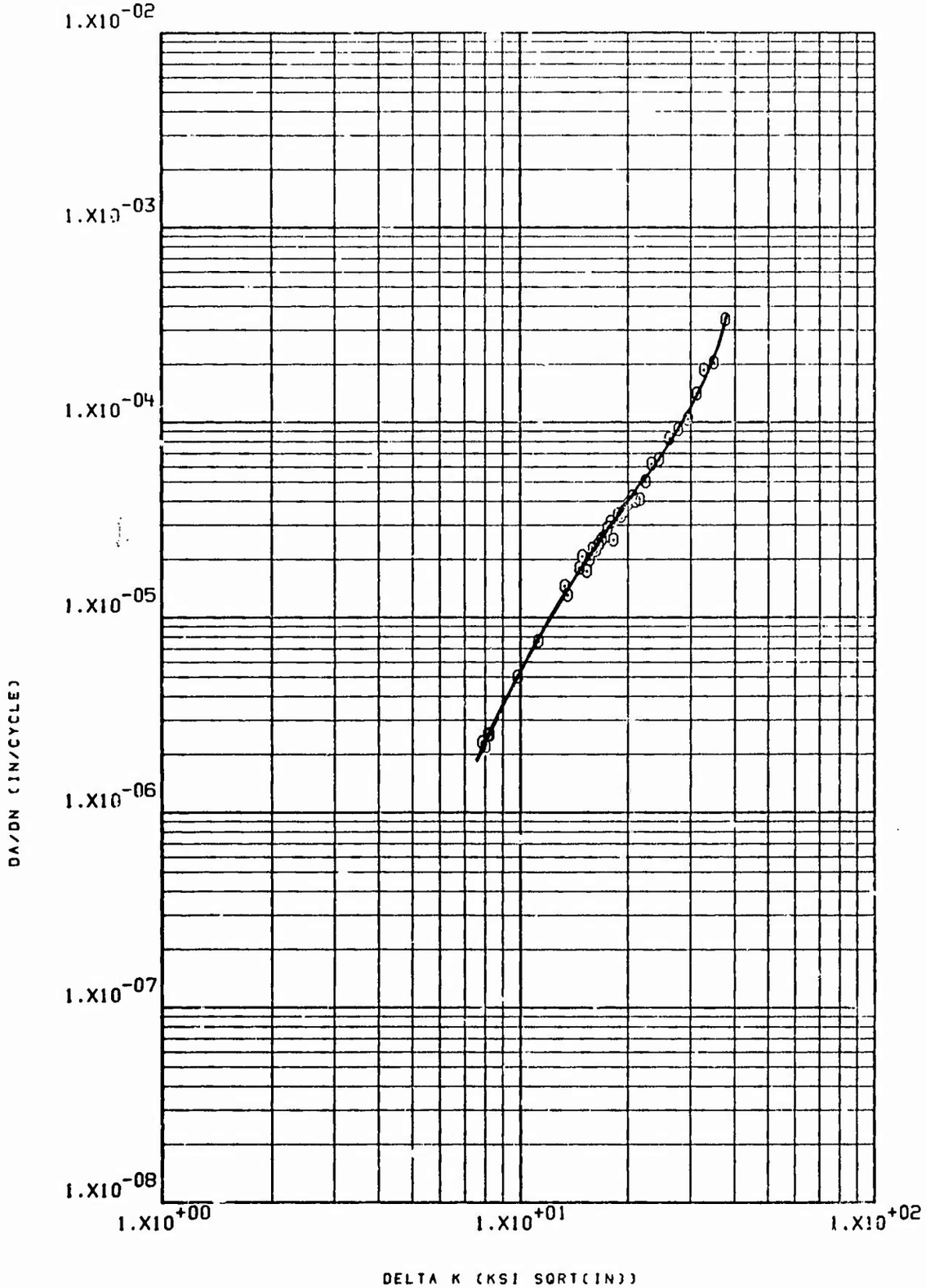


29 NRW 83-11 7075-T73511 SHOP RT R=.08 60 CPM



29 NRW 83-12 7075-T73511 LHA RT R=.7 360CPM



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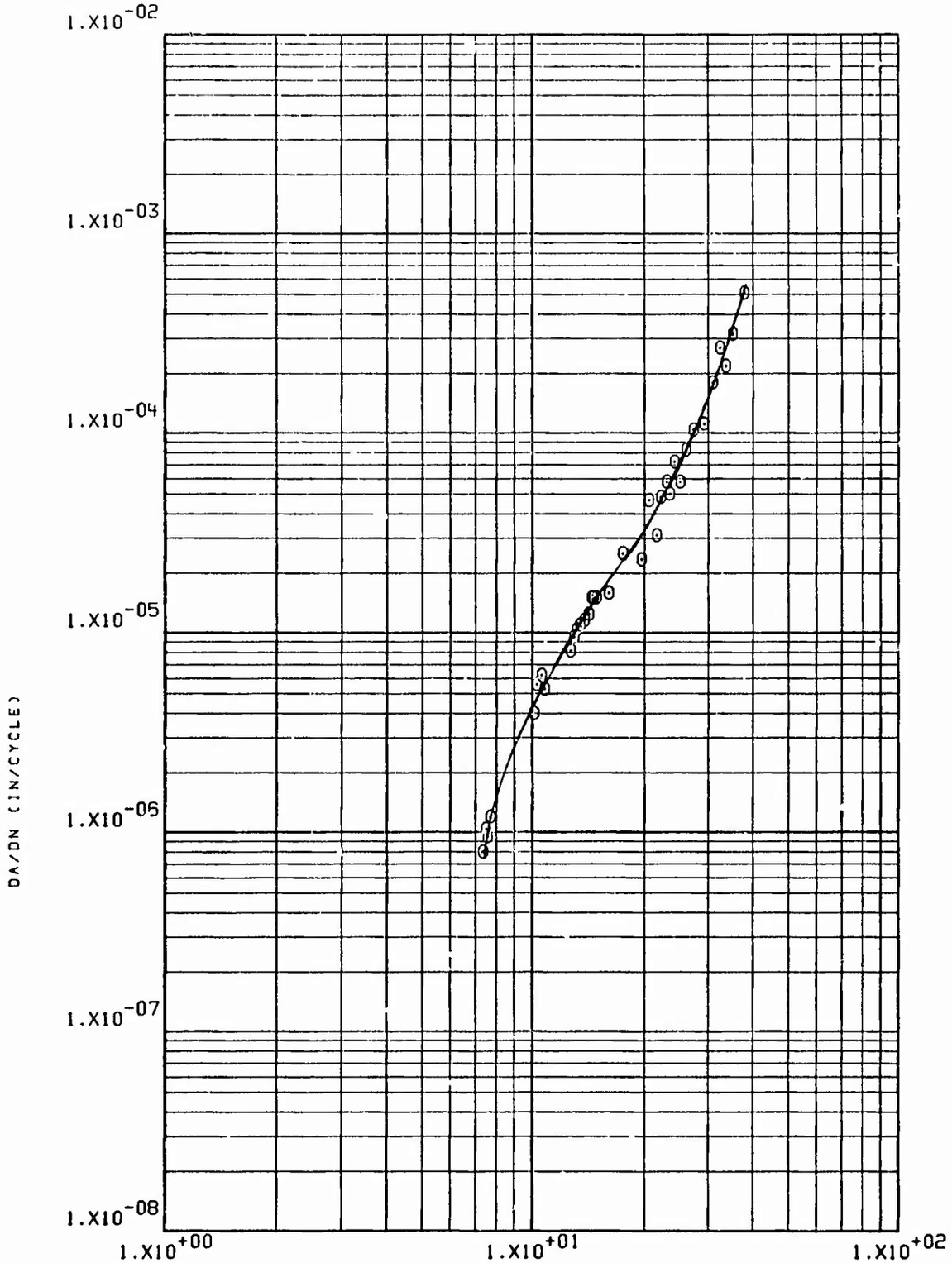

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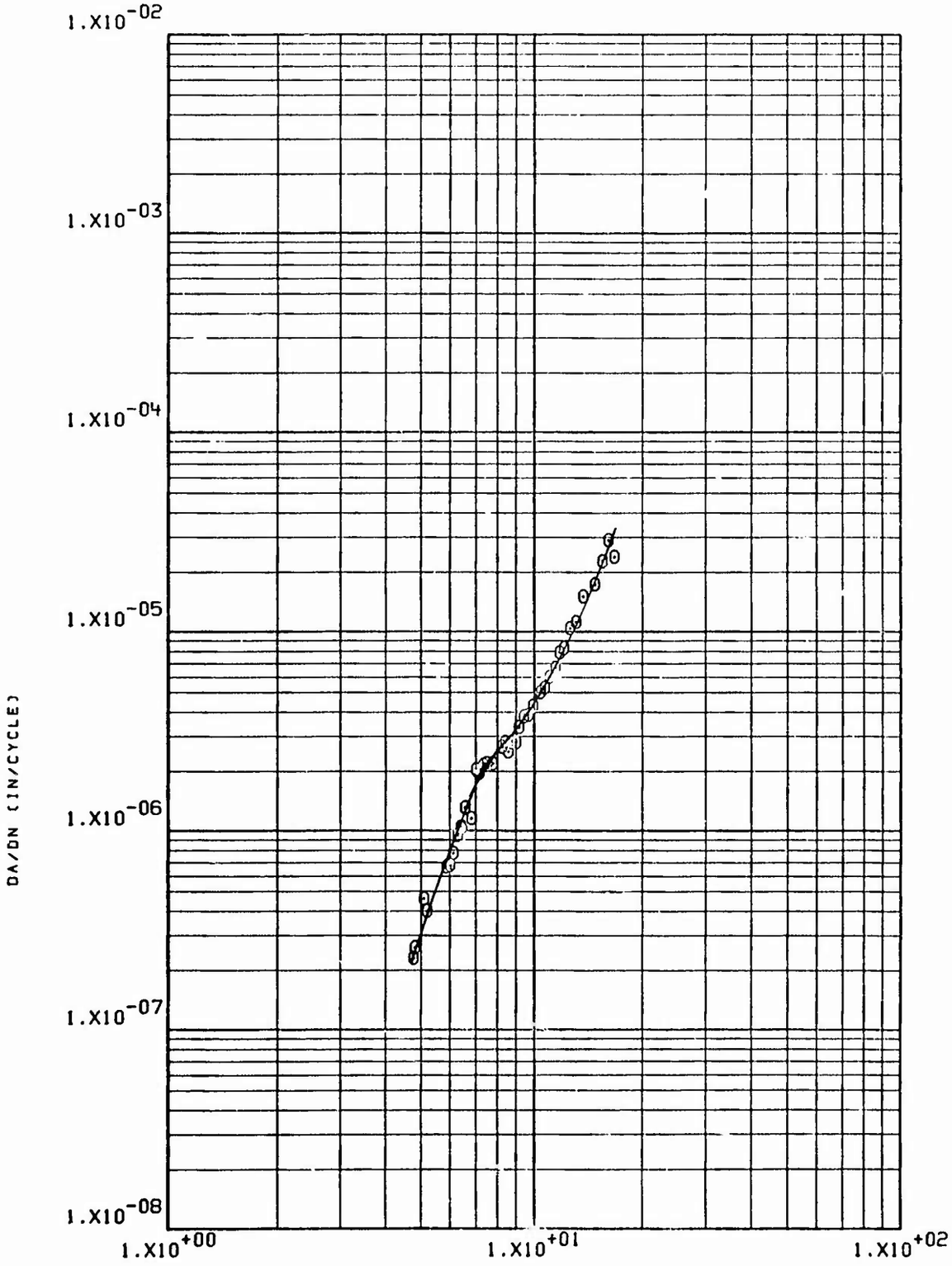

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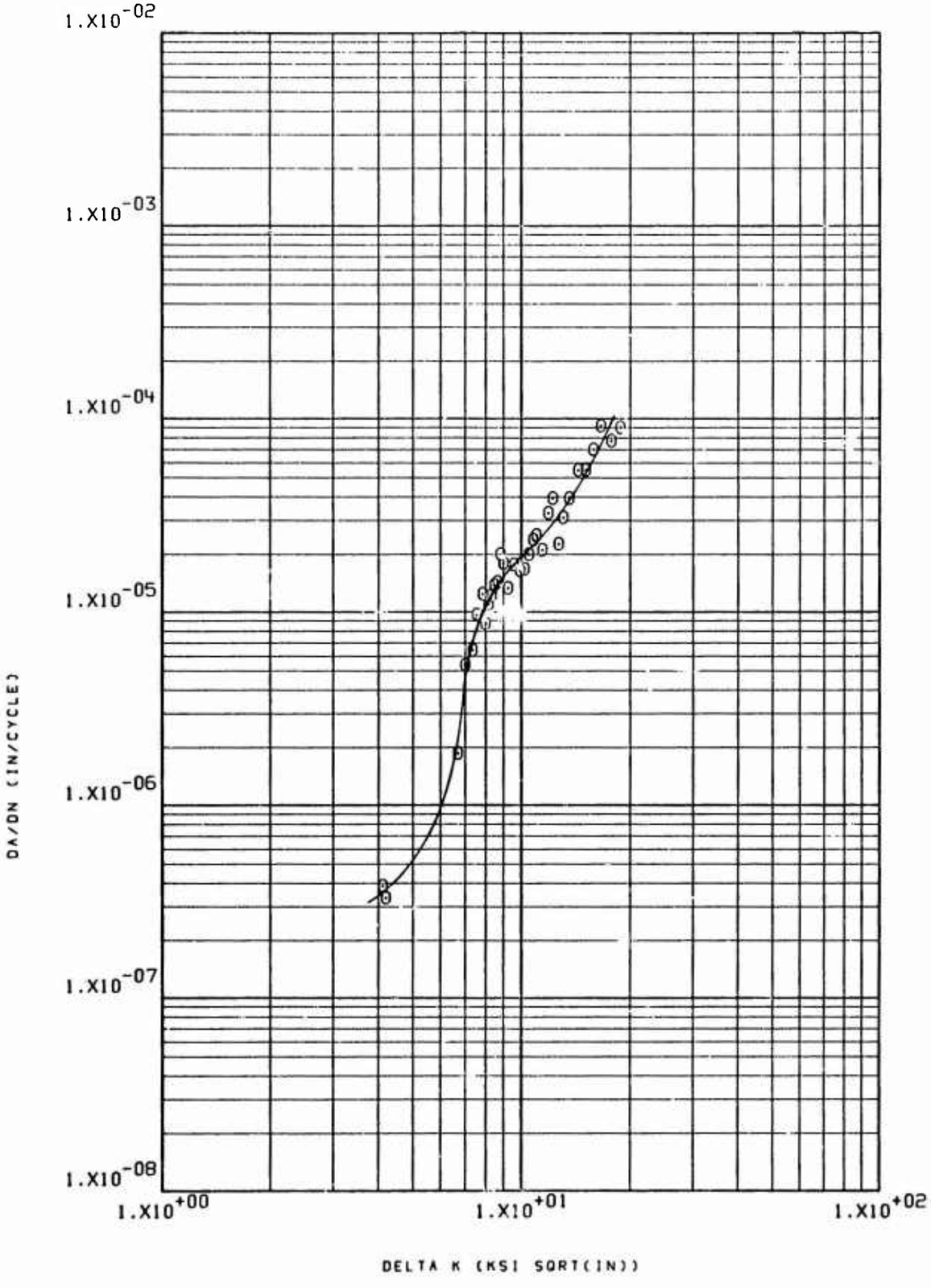

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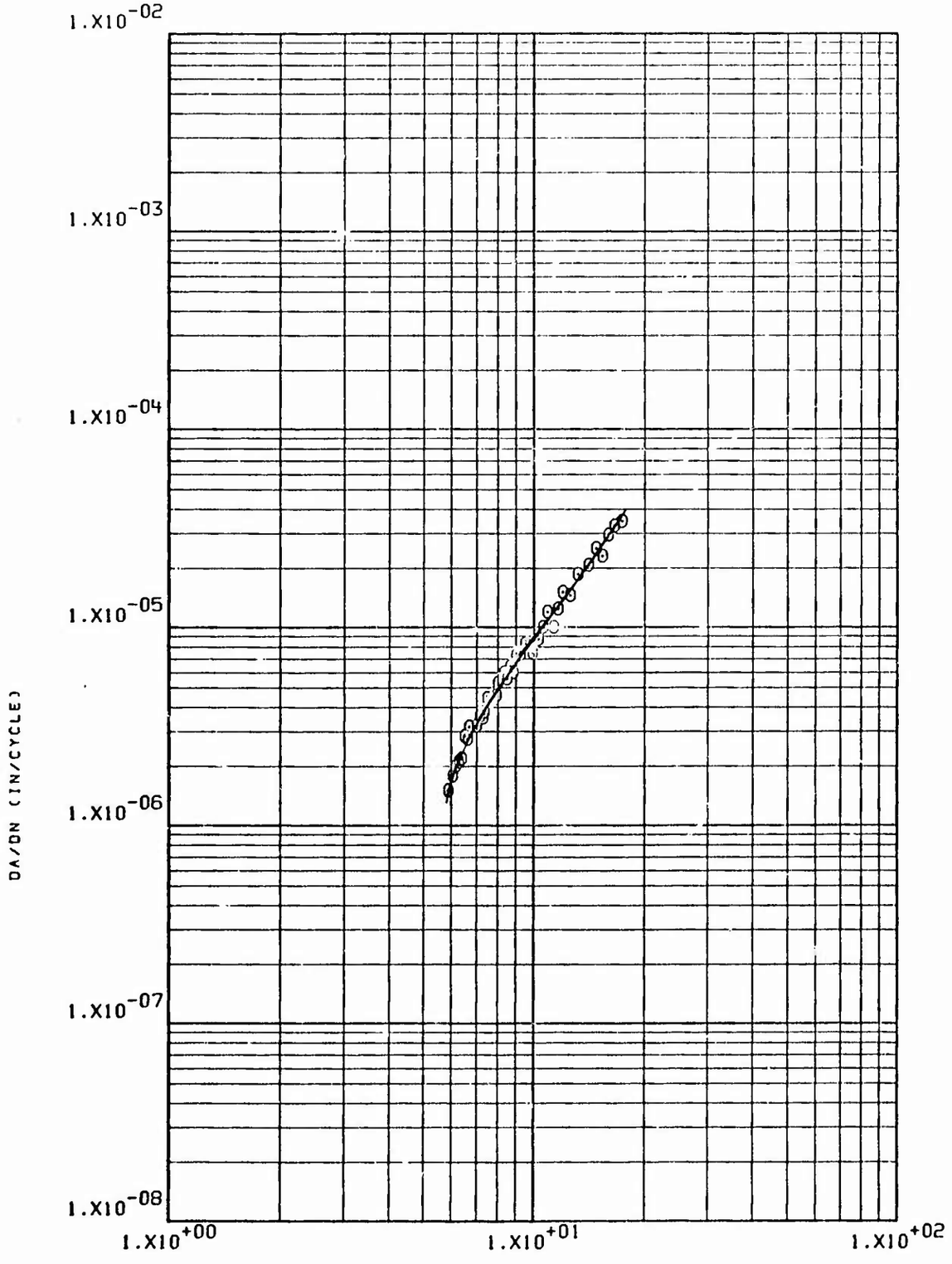
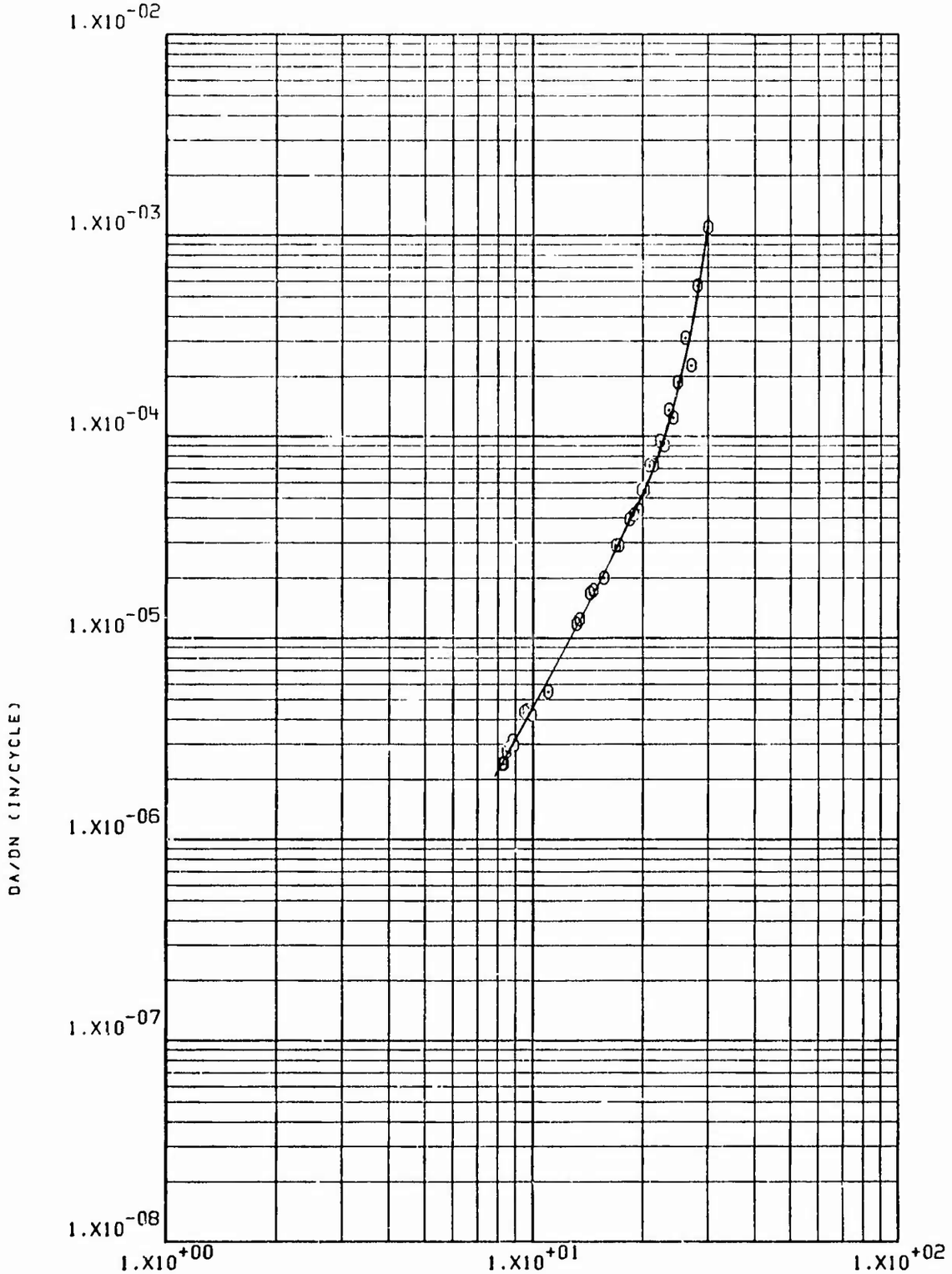
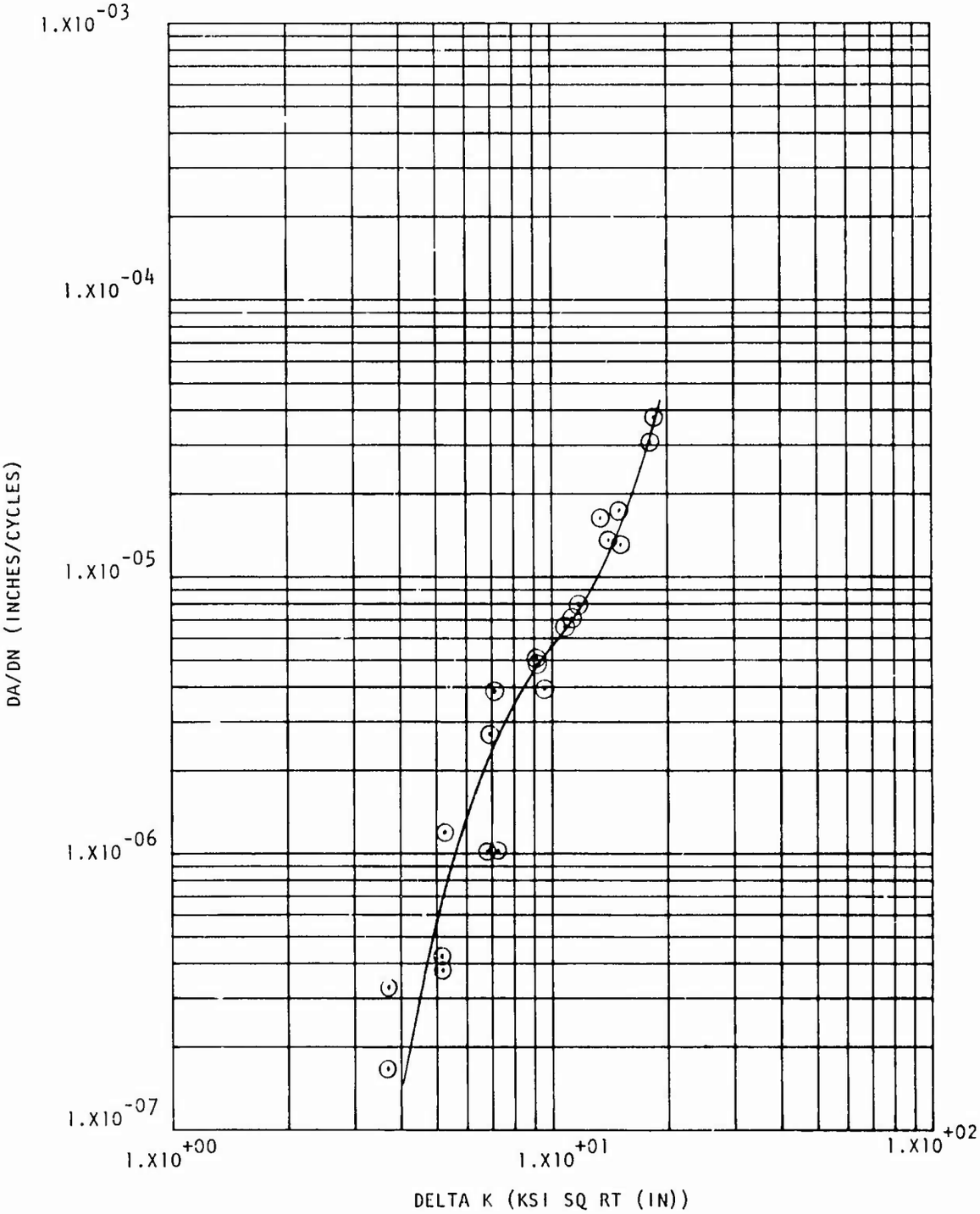


29 NWR 83-17 7075-T73511 SHP CLN SOL R=.08 360CPM RT



29 NWR 83-18 7075-T73511 LHA RT R=.08 360CPM



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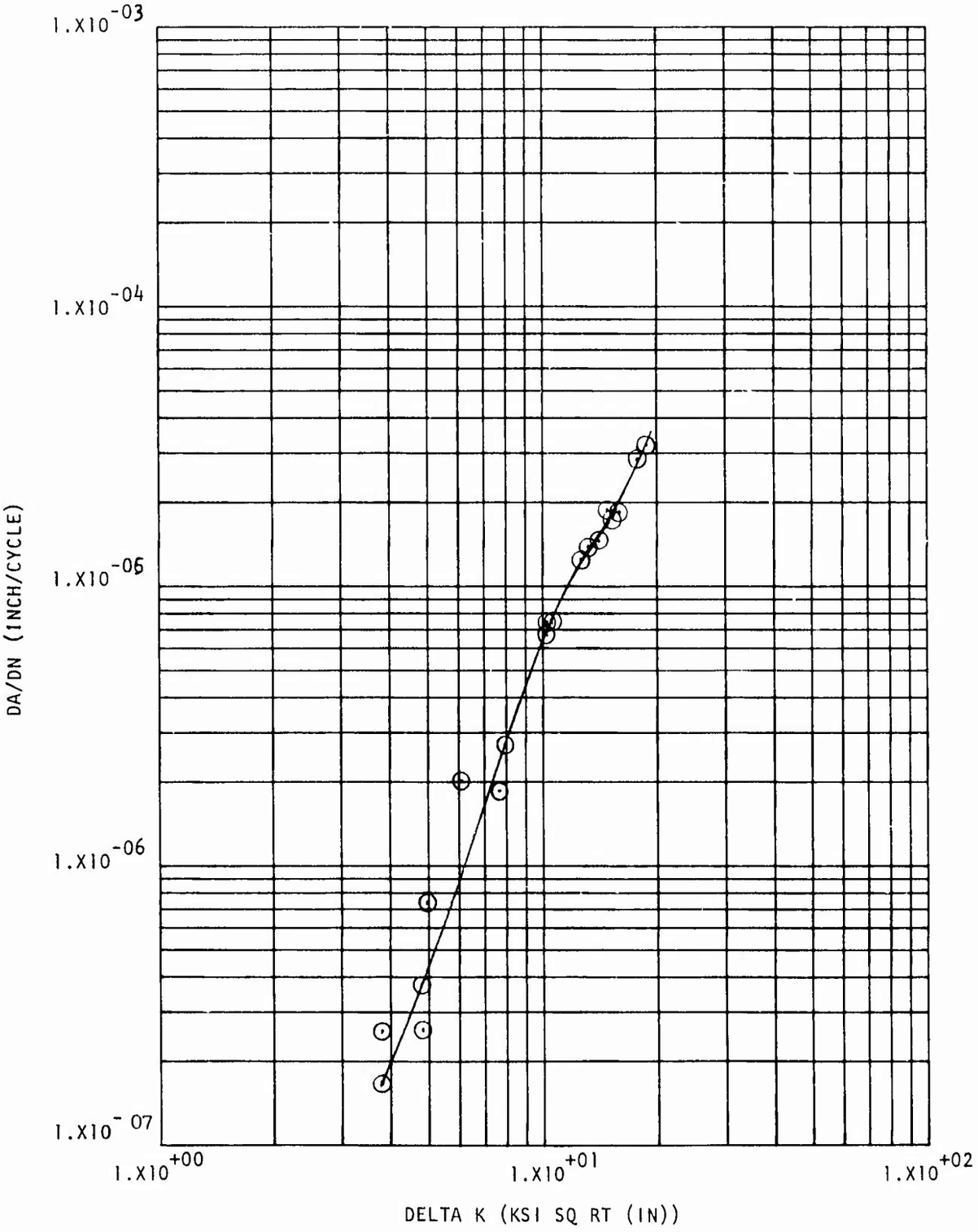

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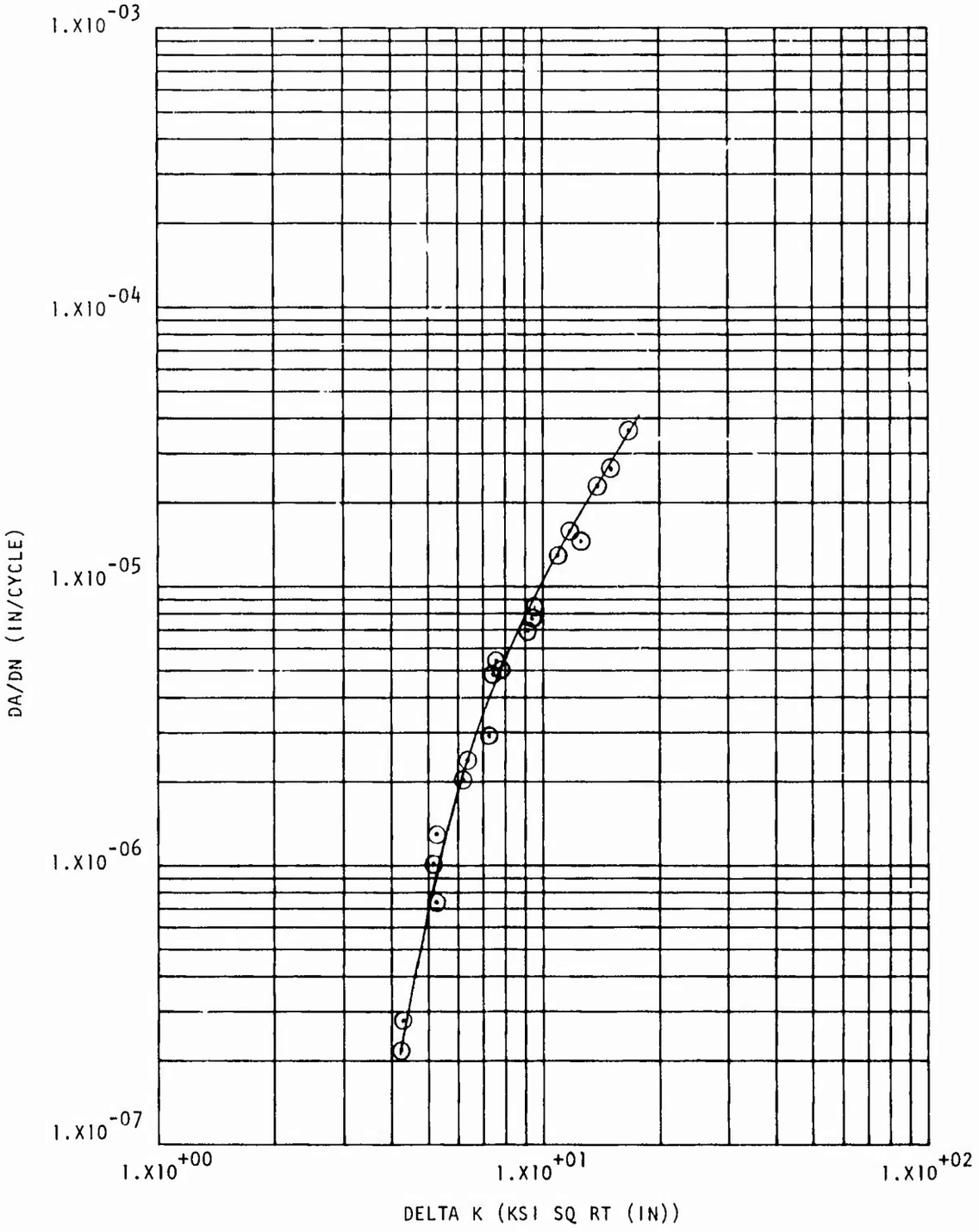
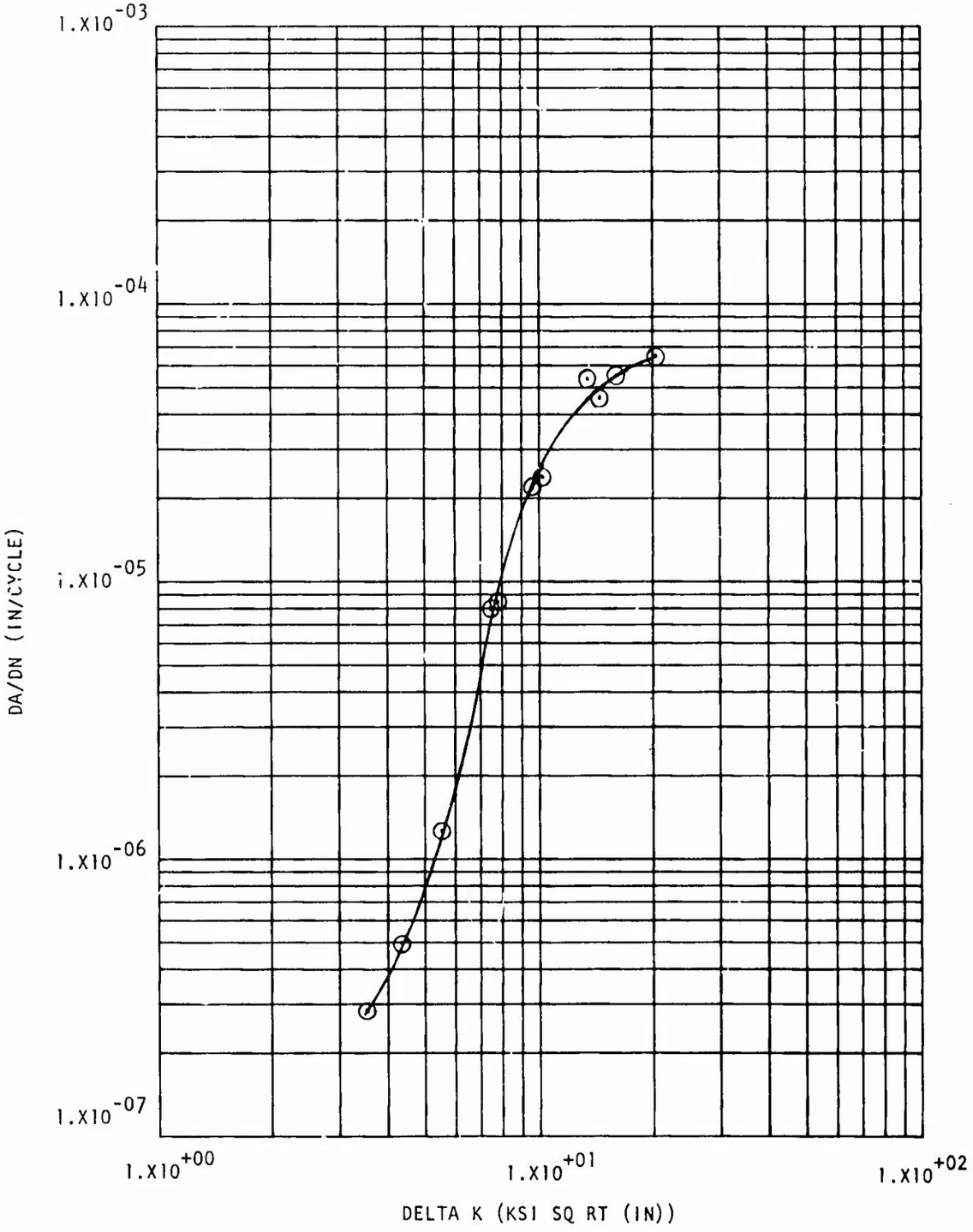
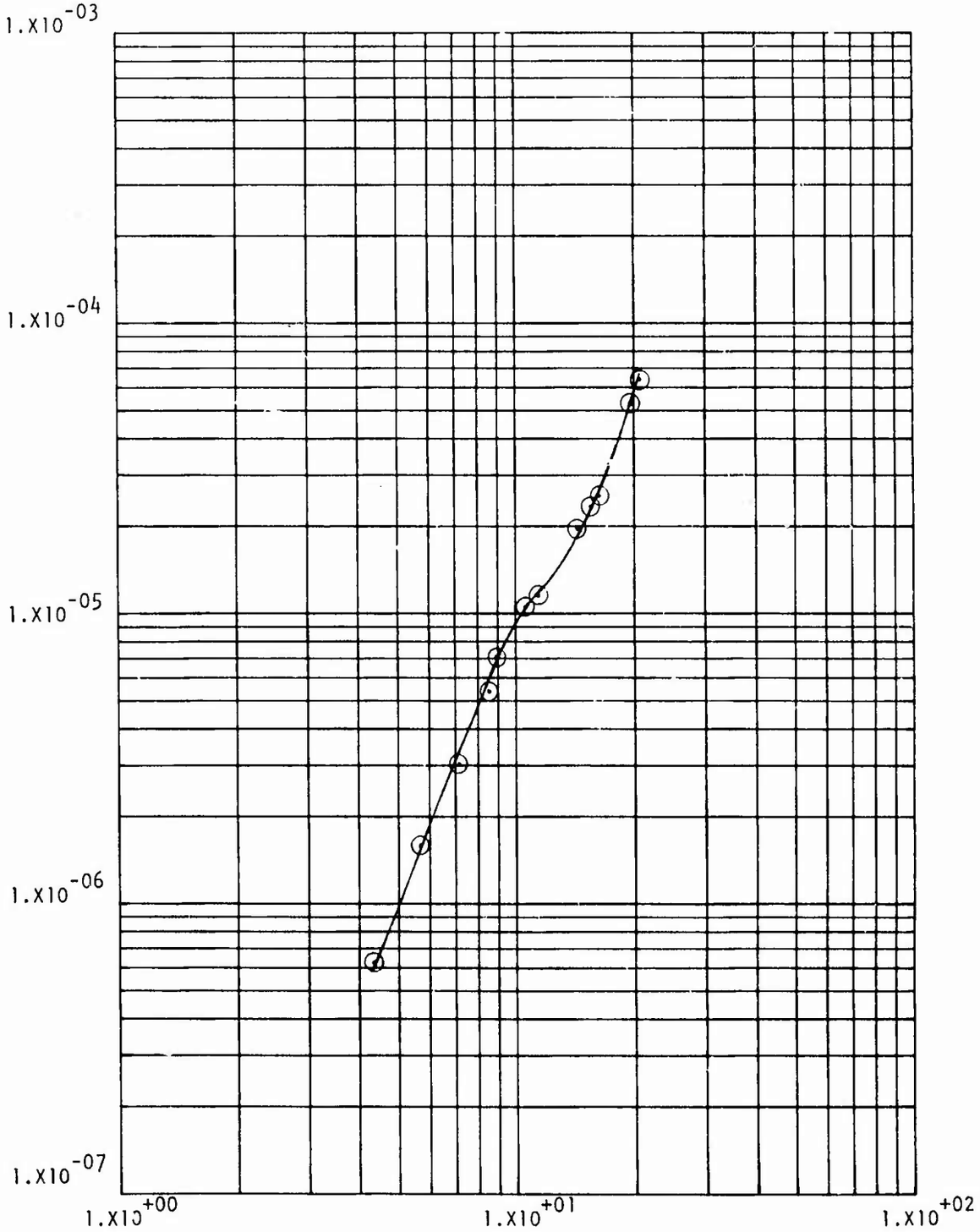


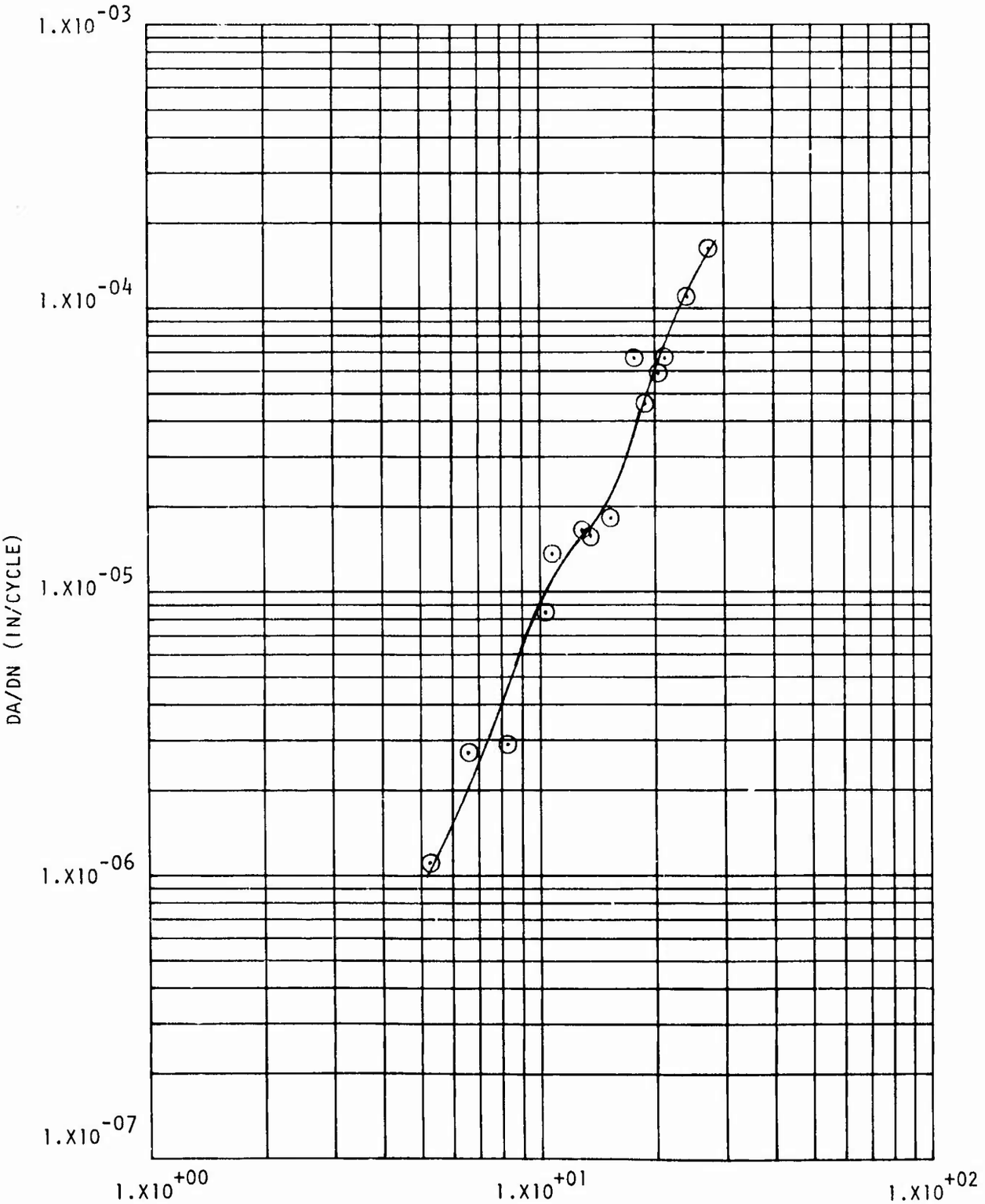
30 NRW 85-3 7075-T76 LHA RT R = 0.3 360 CPM



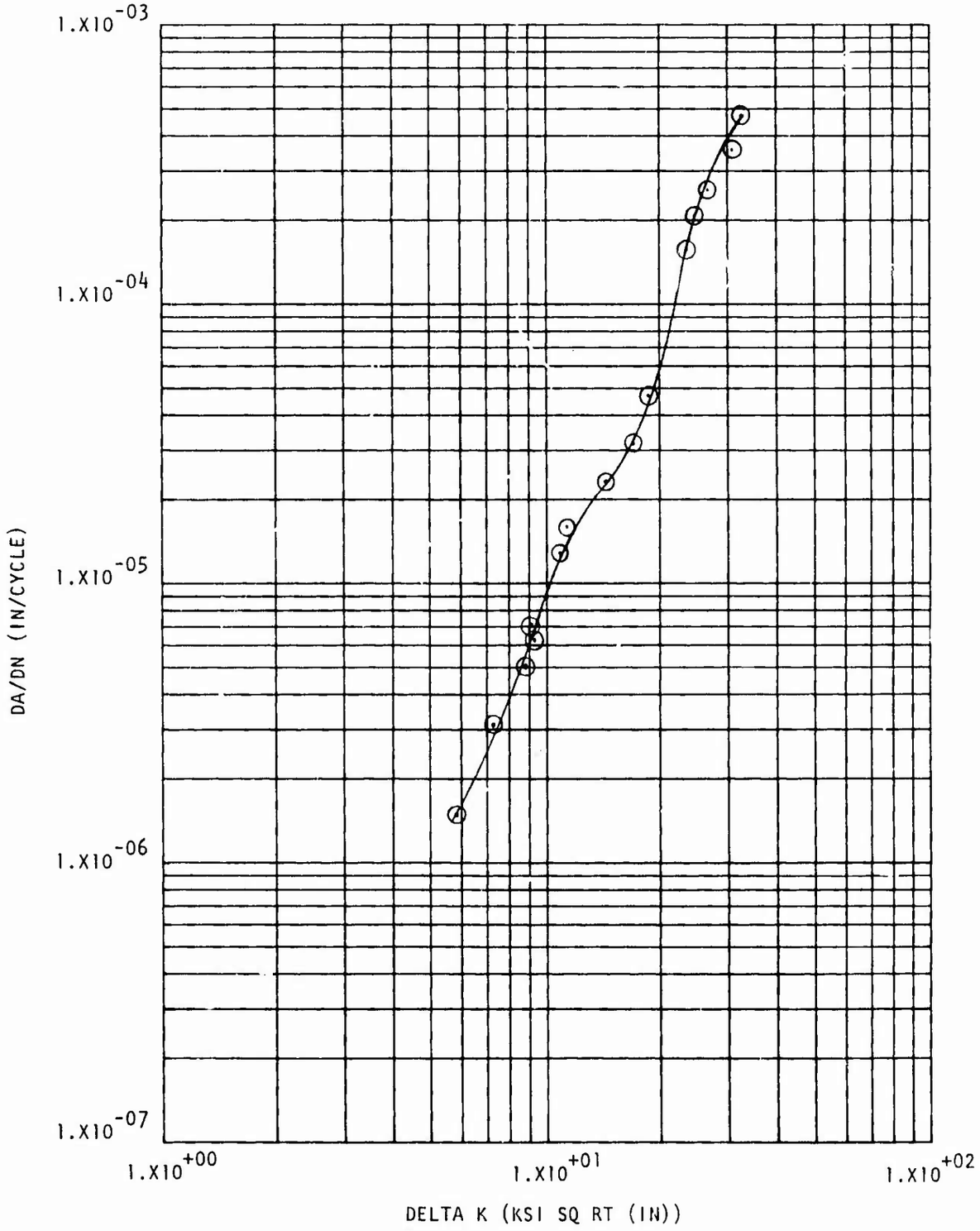
30 NRW 85-4 7075-T76 STW RT R = 0.08 60 CPM



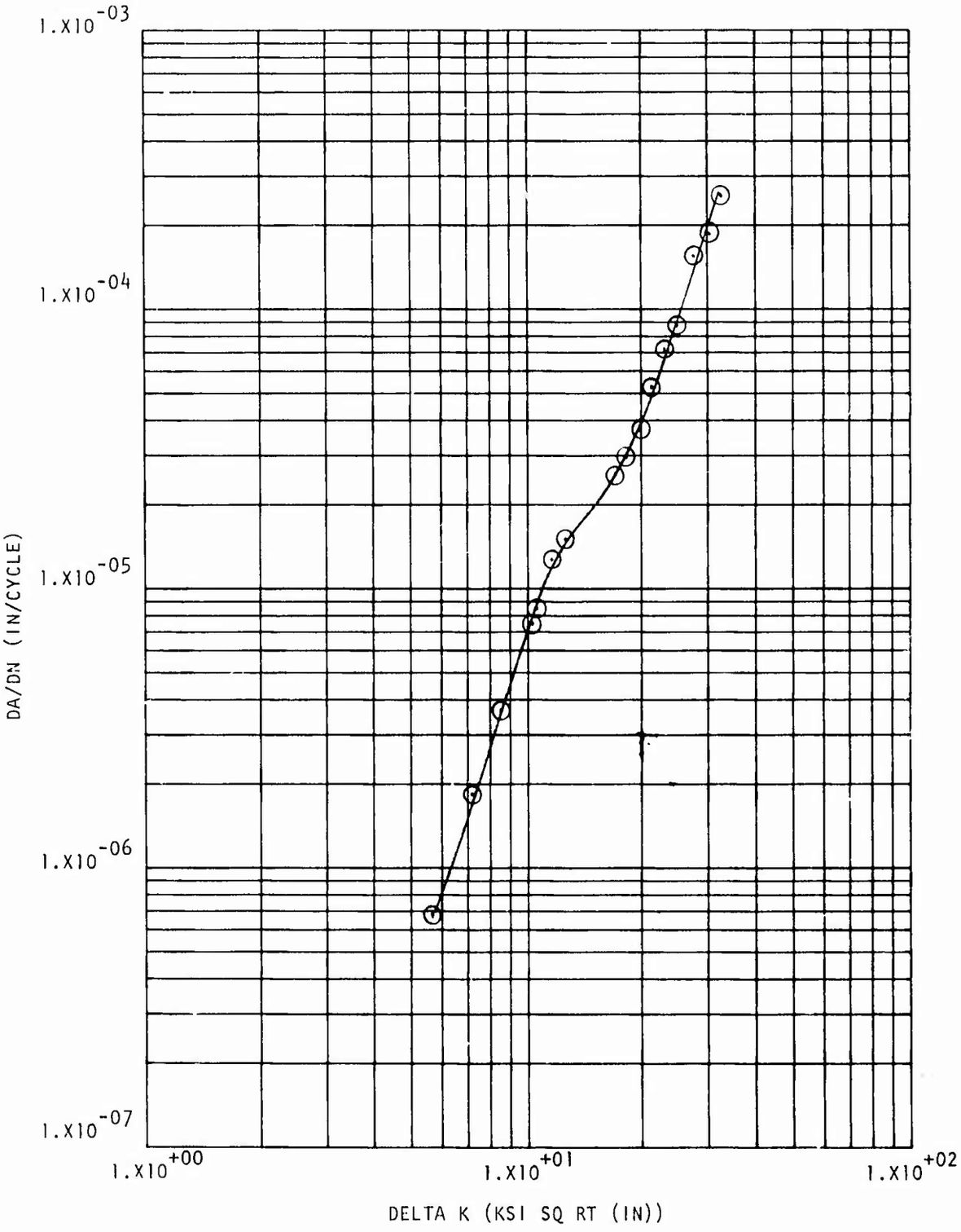
30 NRW 85-5 7075-T76 SCS RT R = 0.08 60 CPM



30 NRW 85-7 7075-T76 FREON TF RT R = 0.08 60 CPM



30 NWR 85-12 7075-T76 LHA RT R = 0.08 360 CPM



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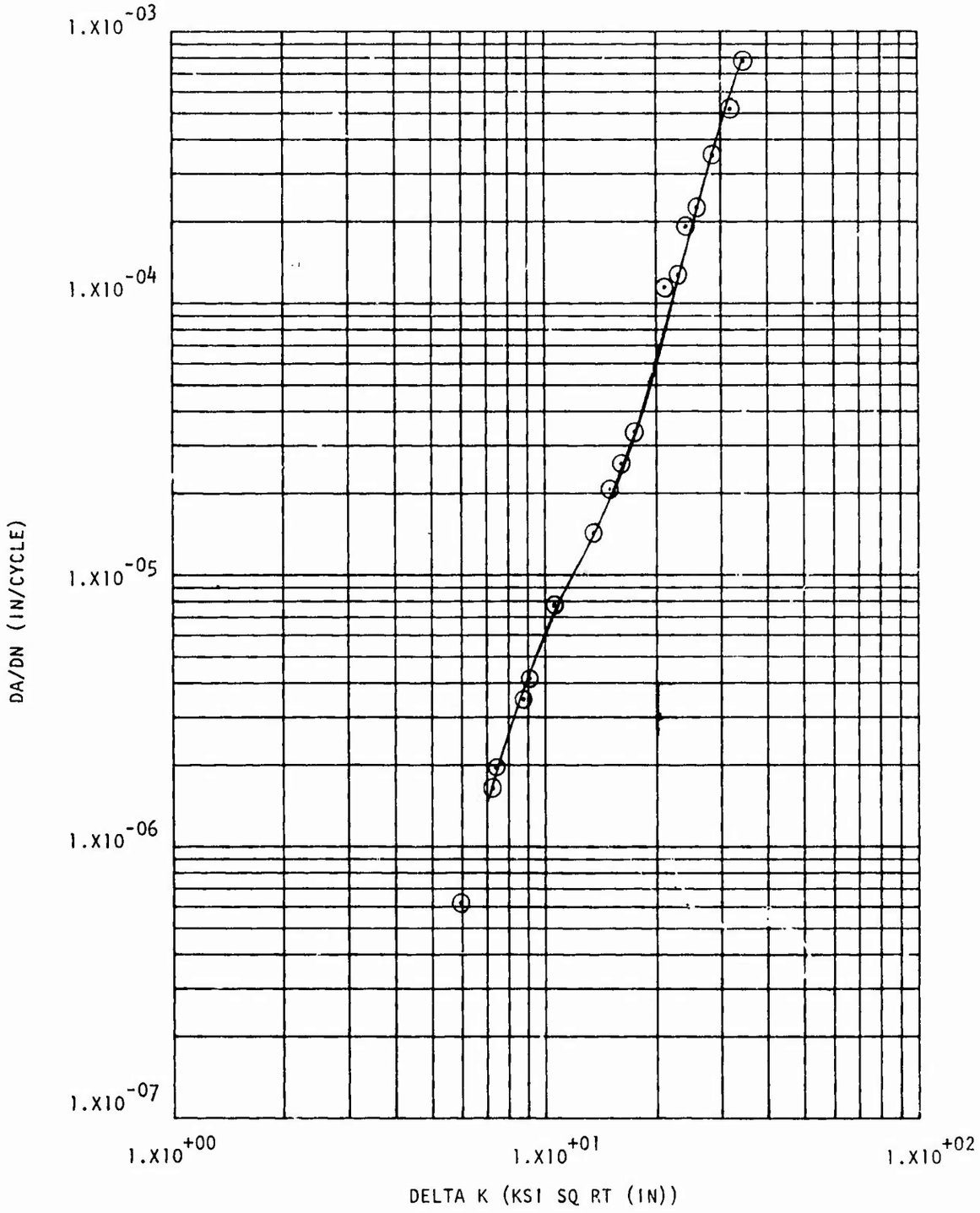
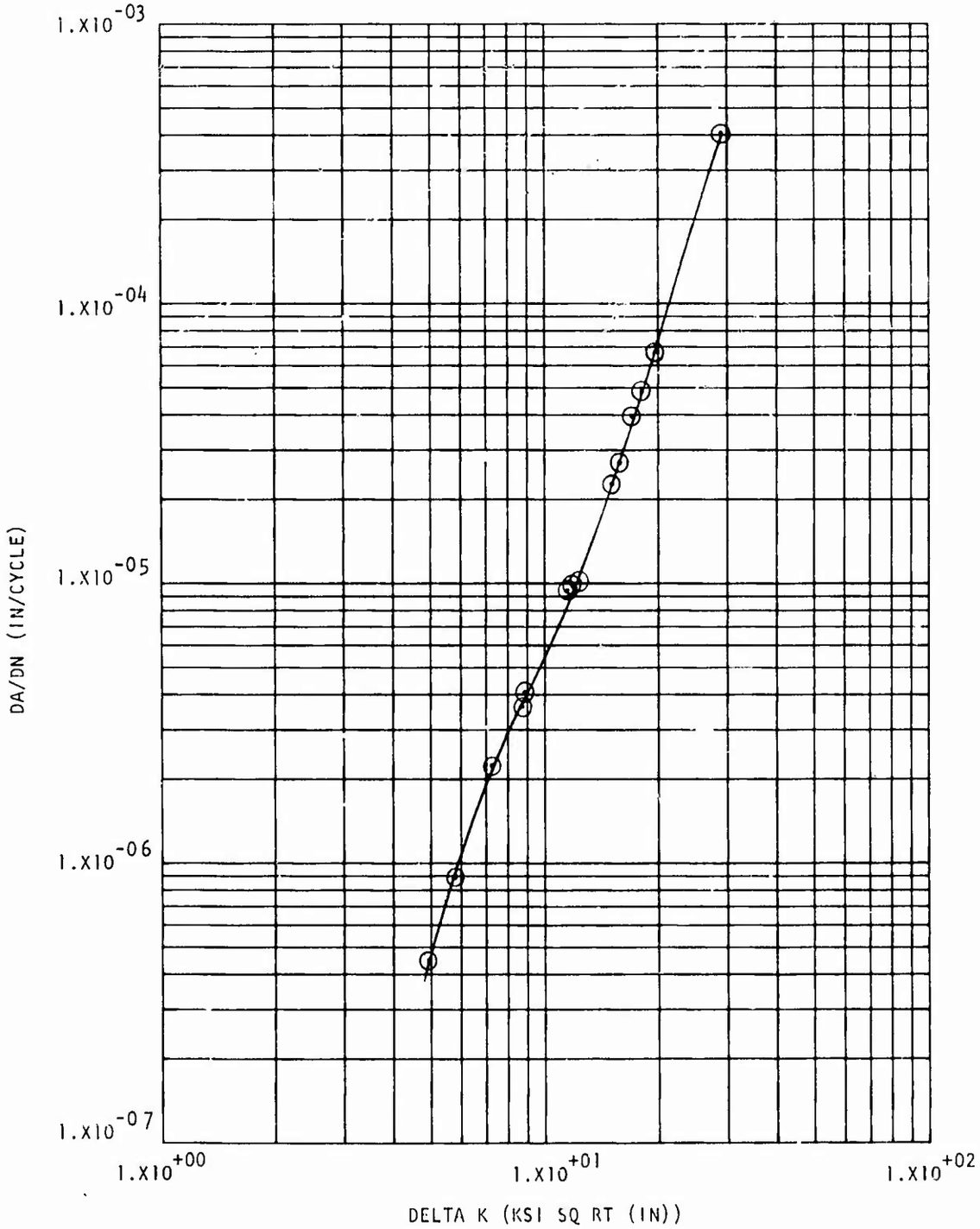
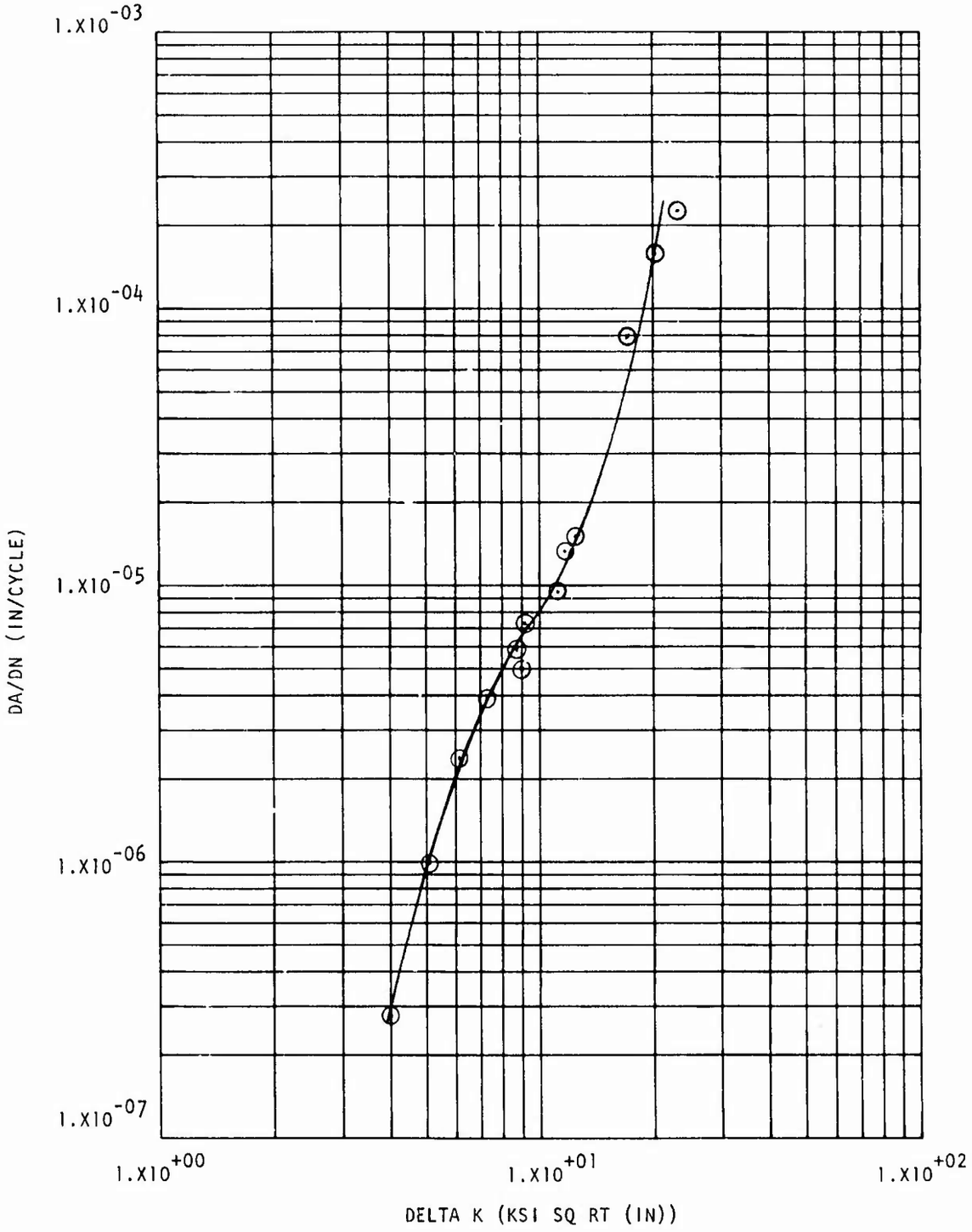


302 NRW 87-1 2024-T81 LHA RT R = 0.08 60 CPM



302 NRW 87-2 2024-T81 LHA RT R = 0.08 360 CPM



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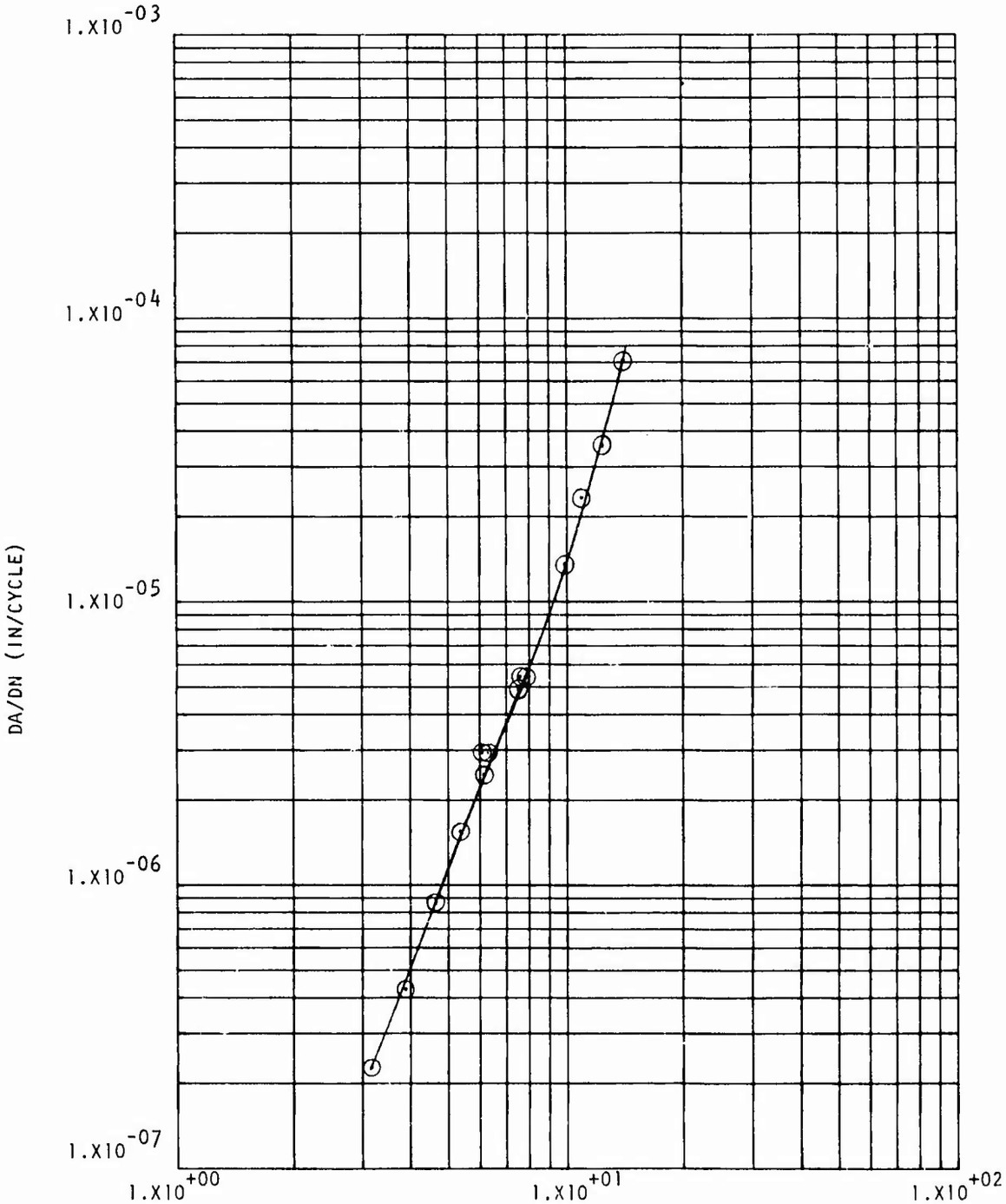

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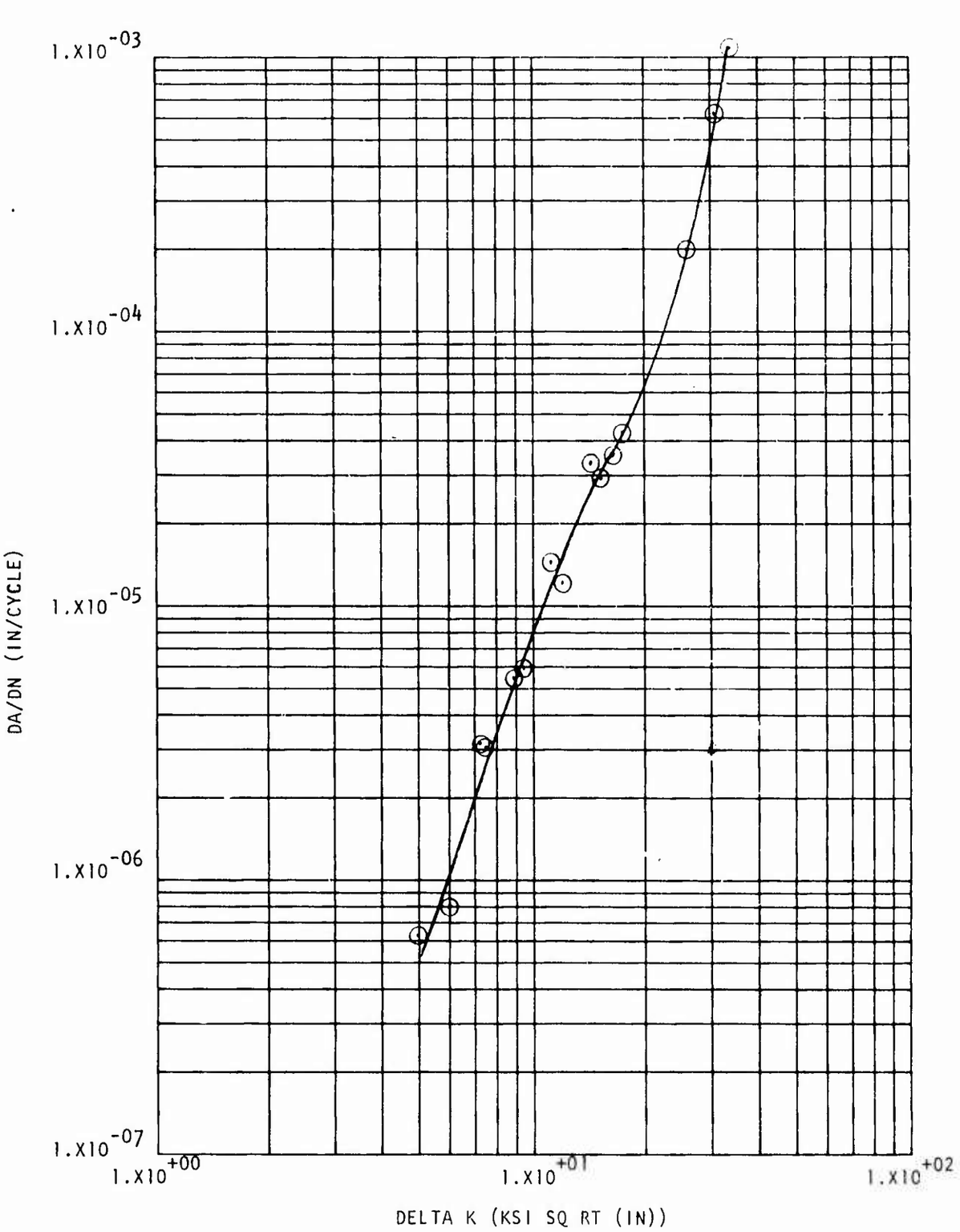

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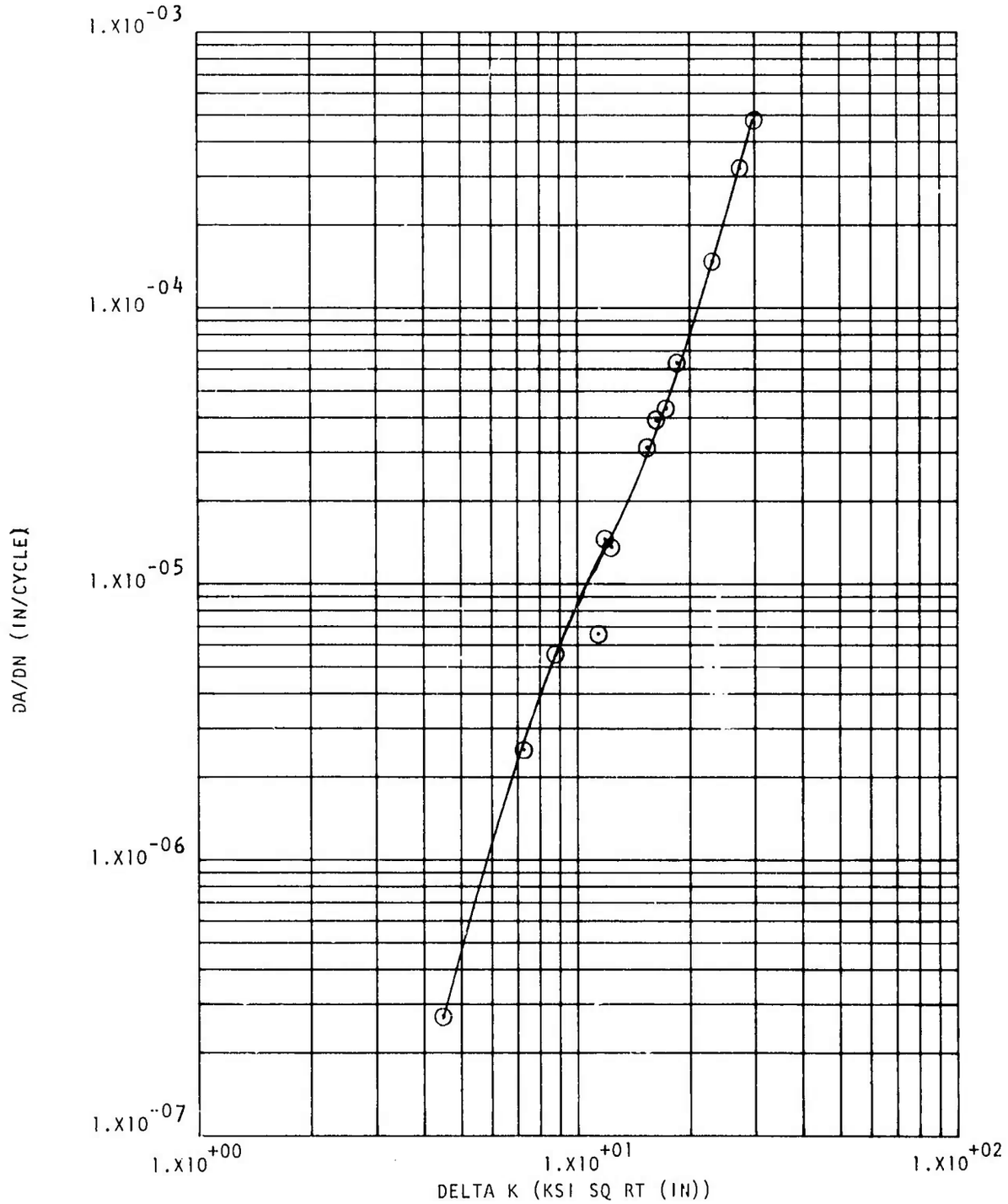

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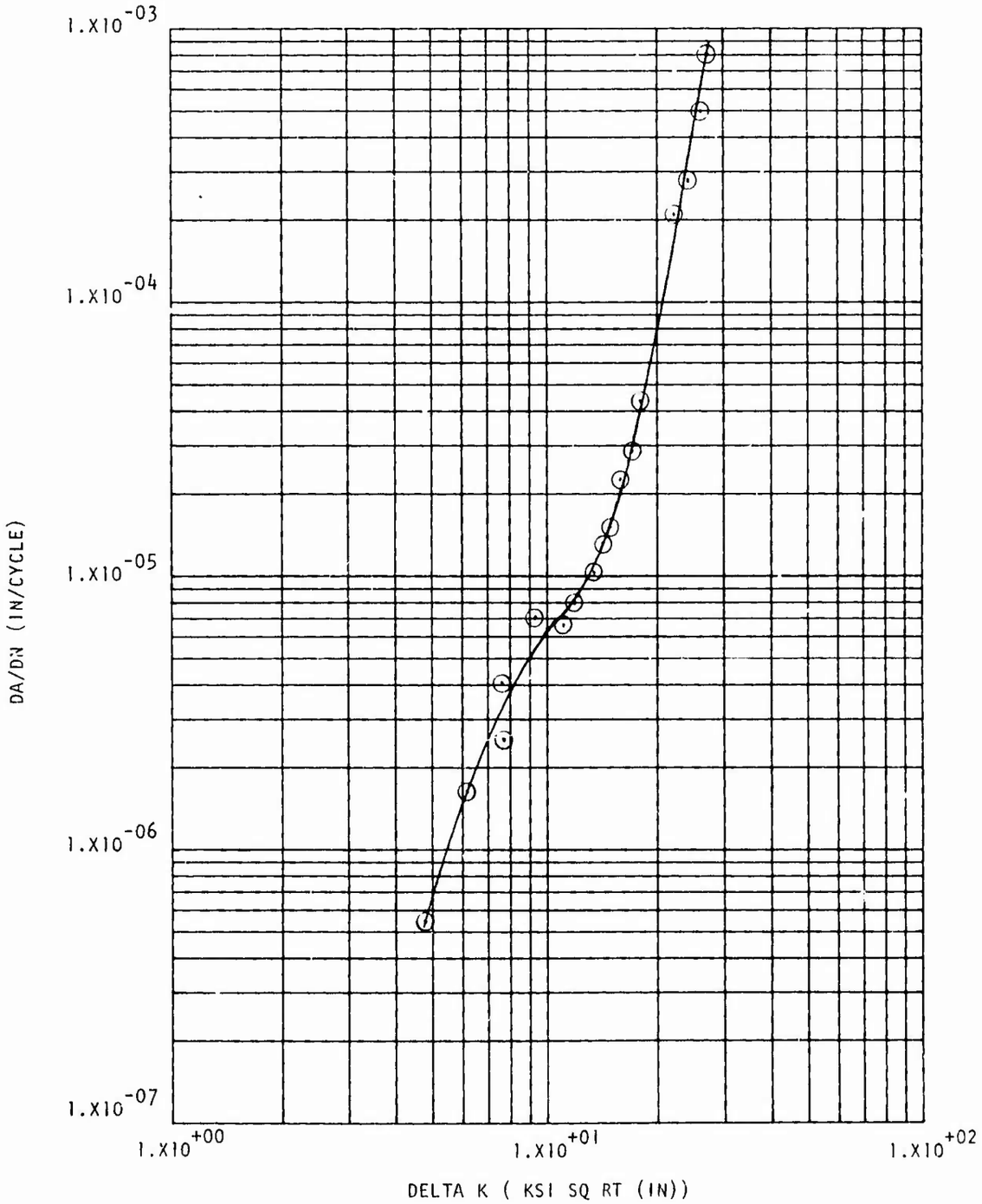

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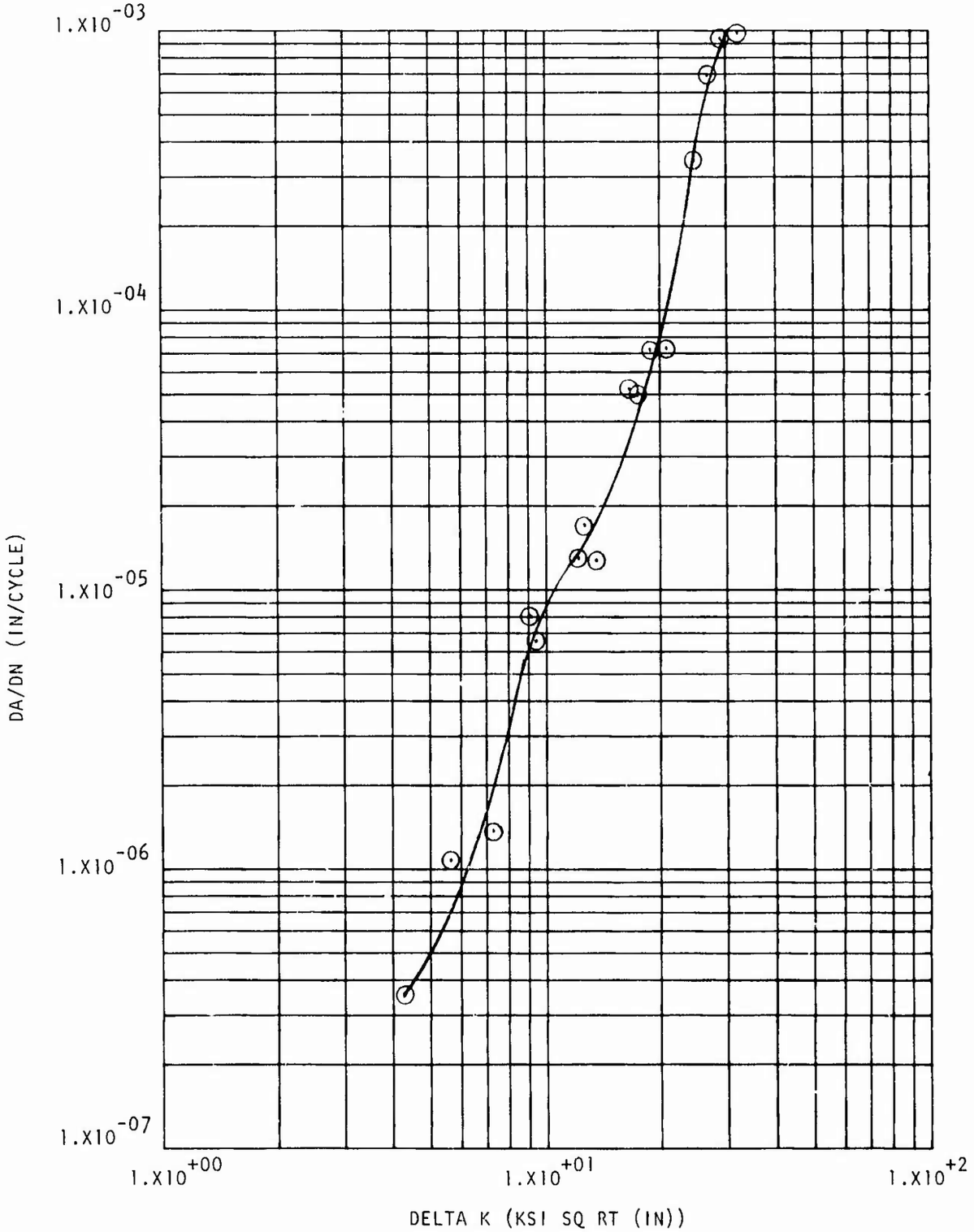

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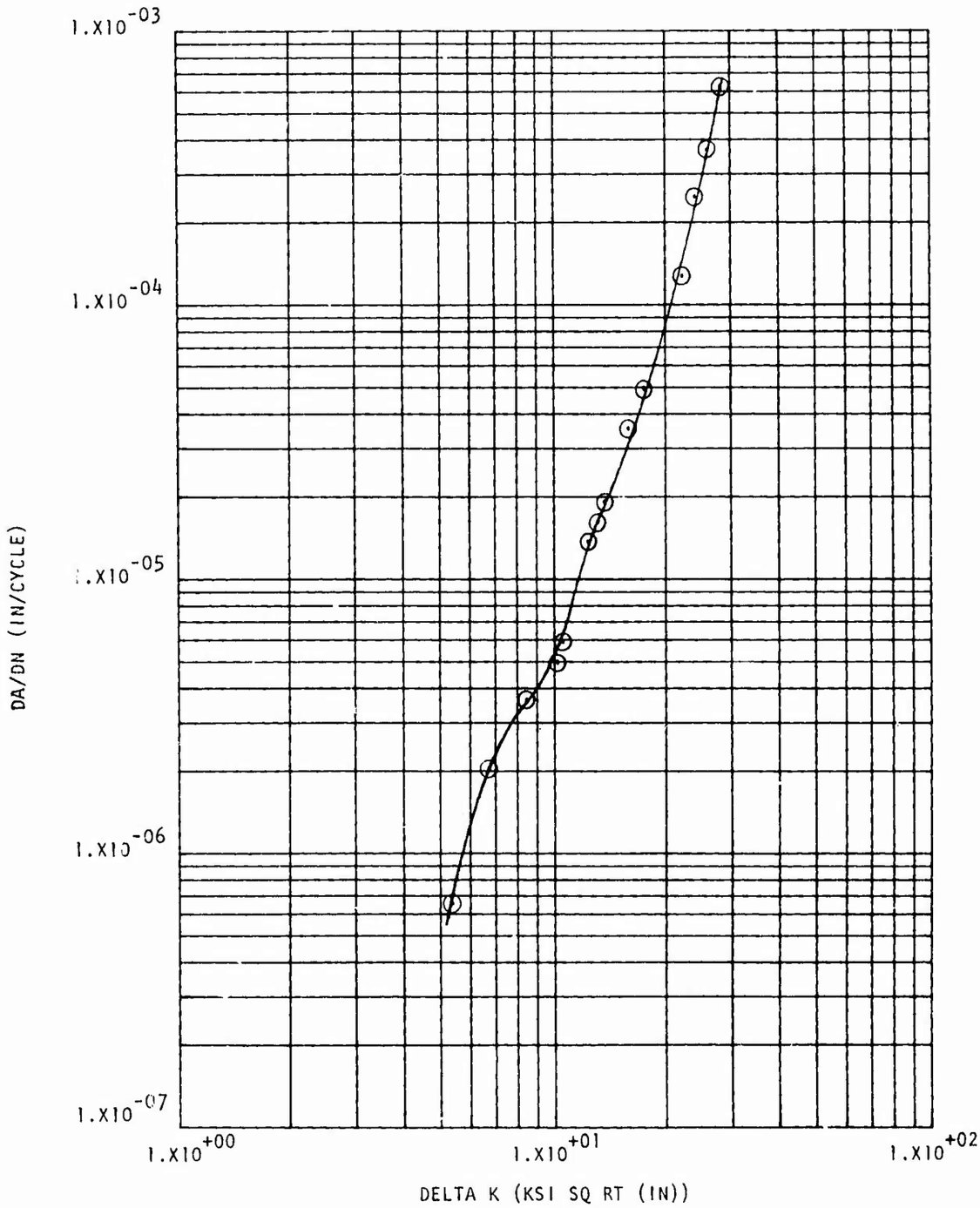

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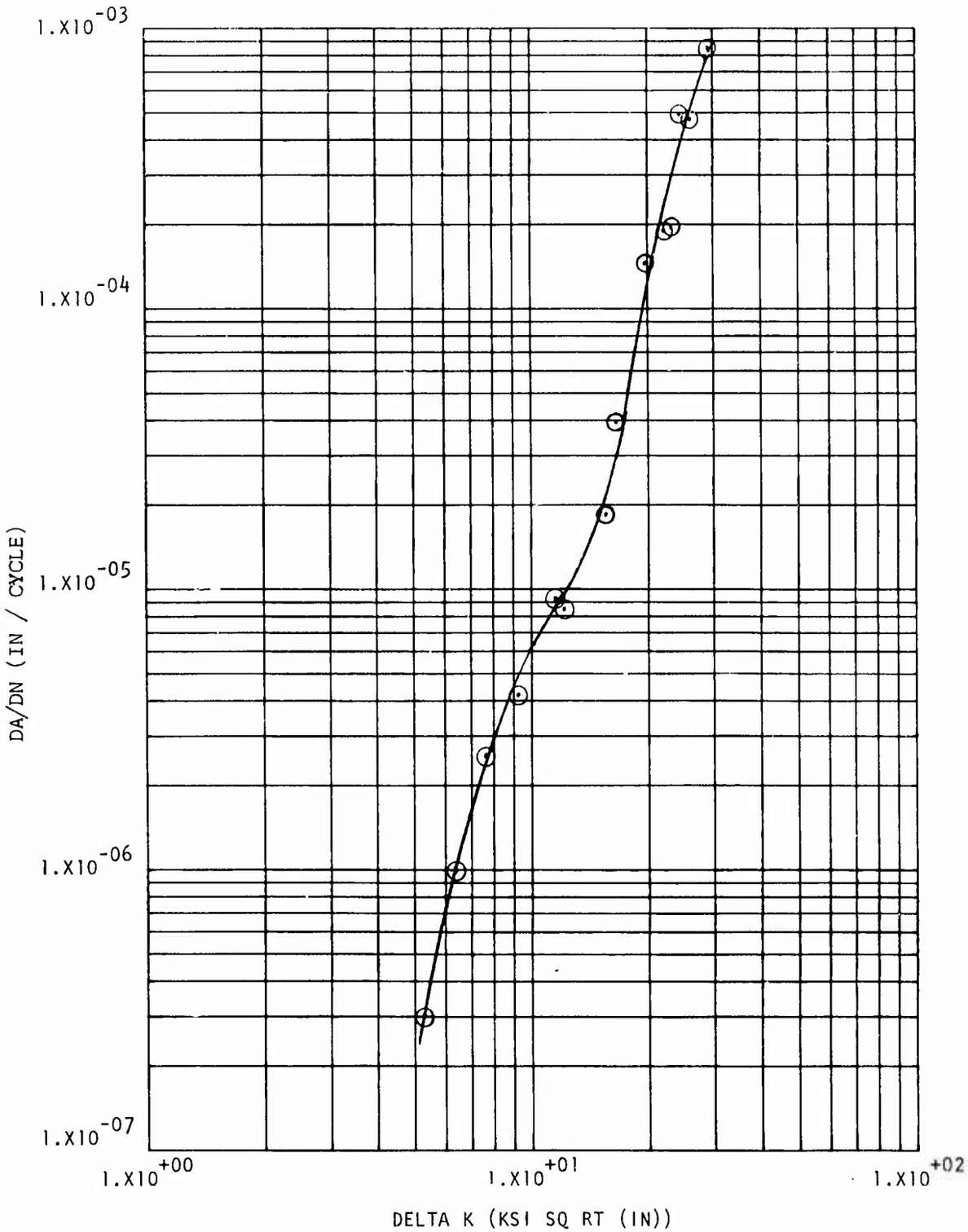

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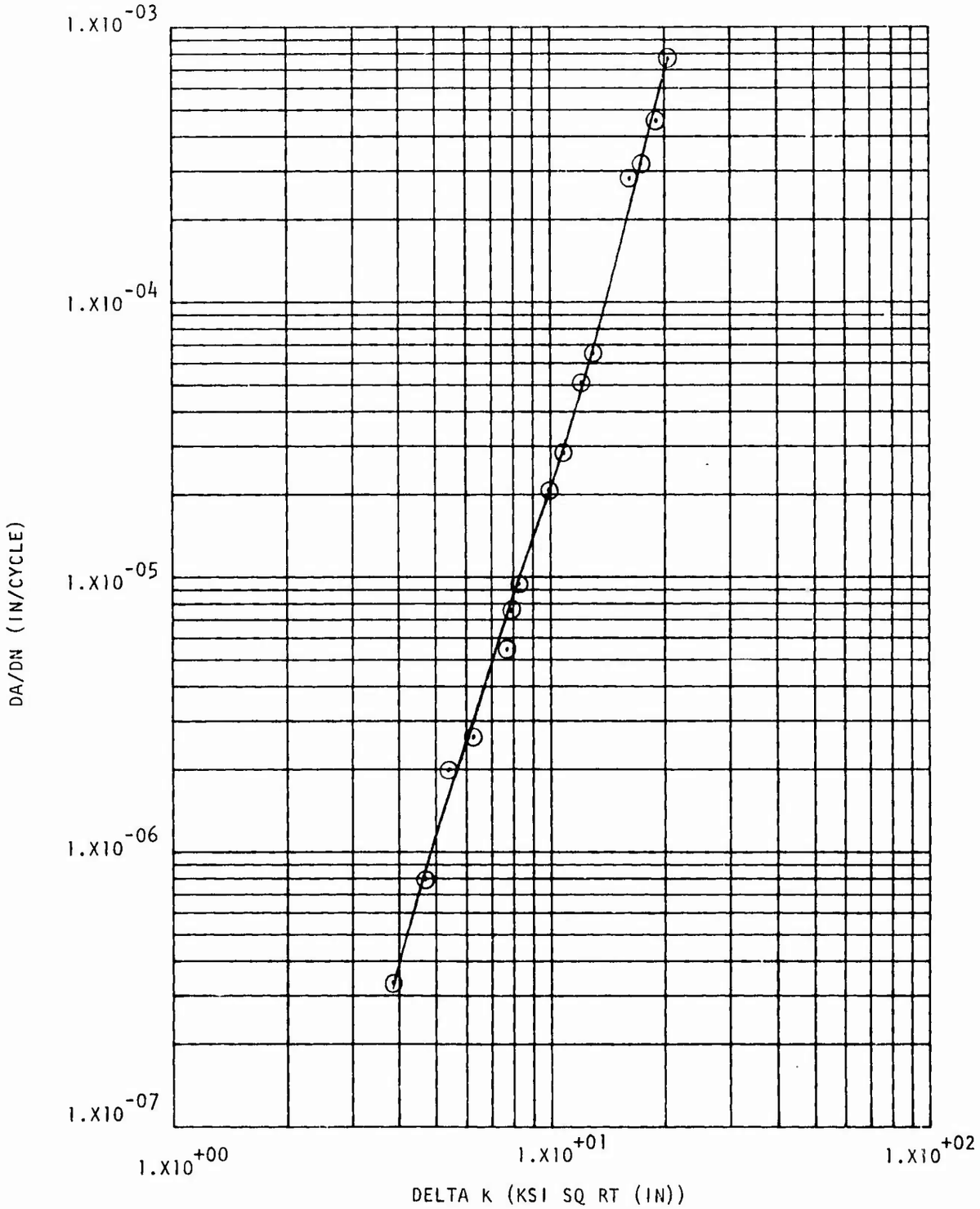

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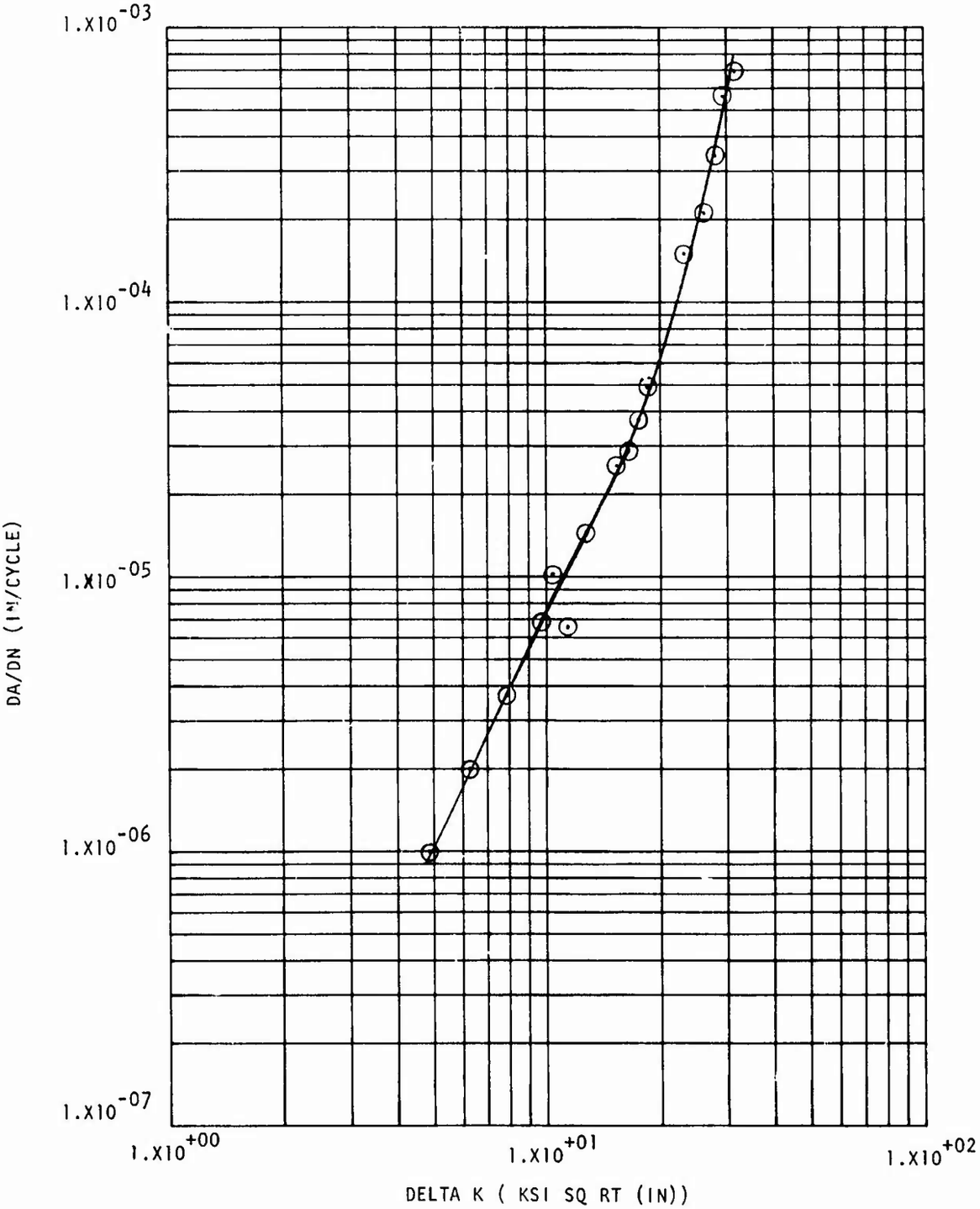

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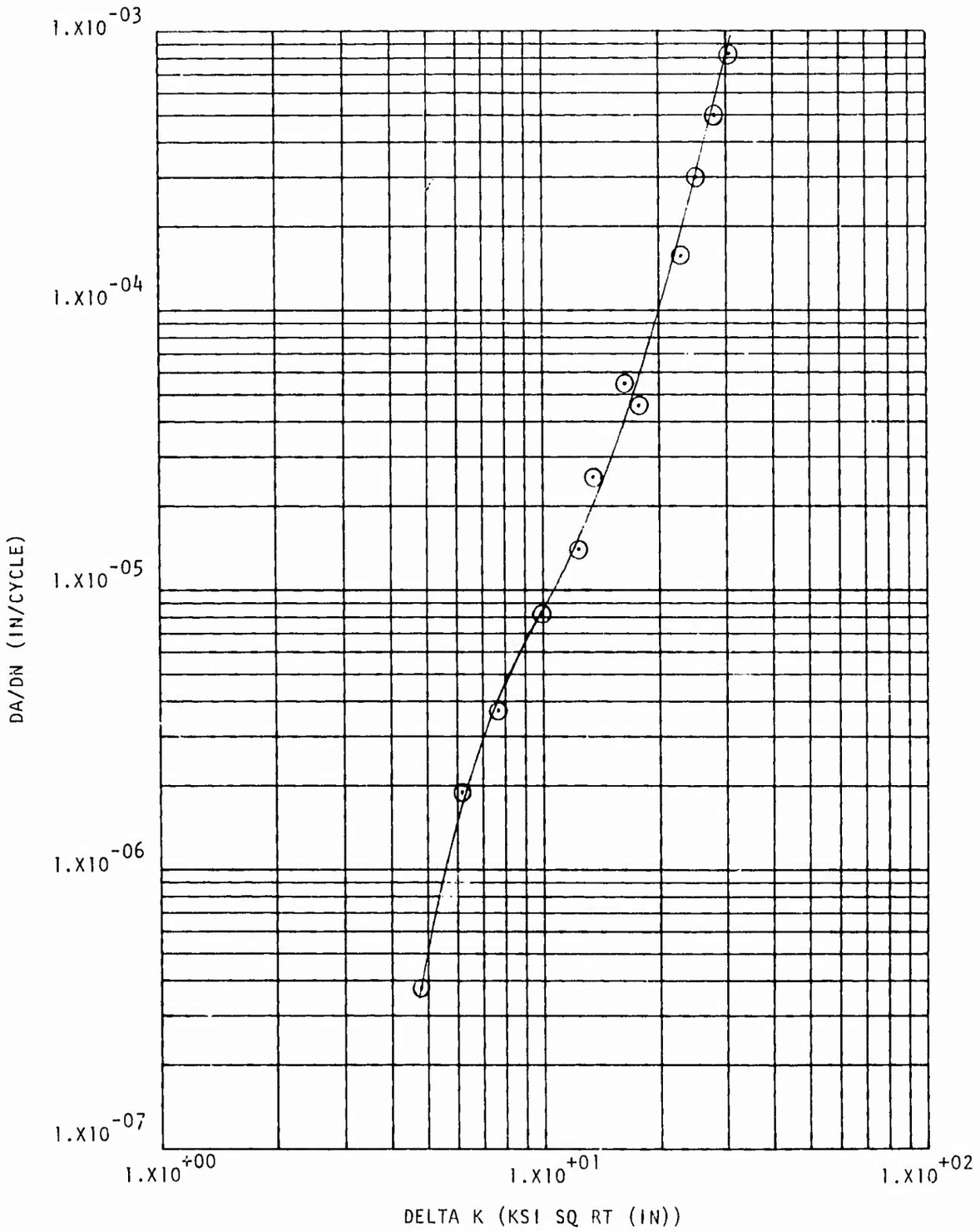

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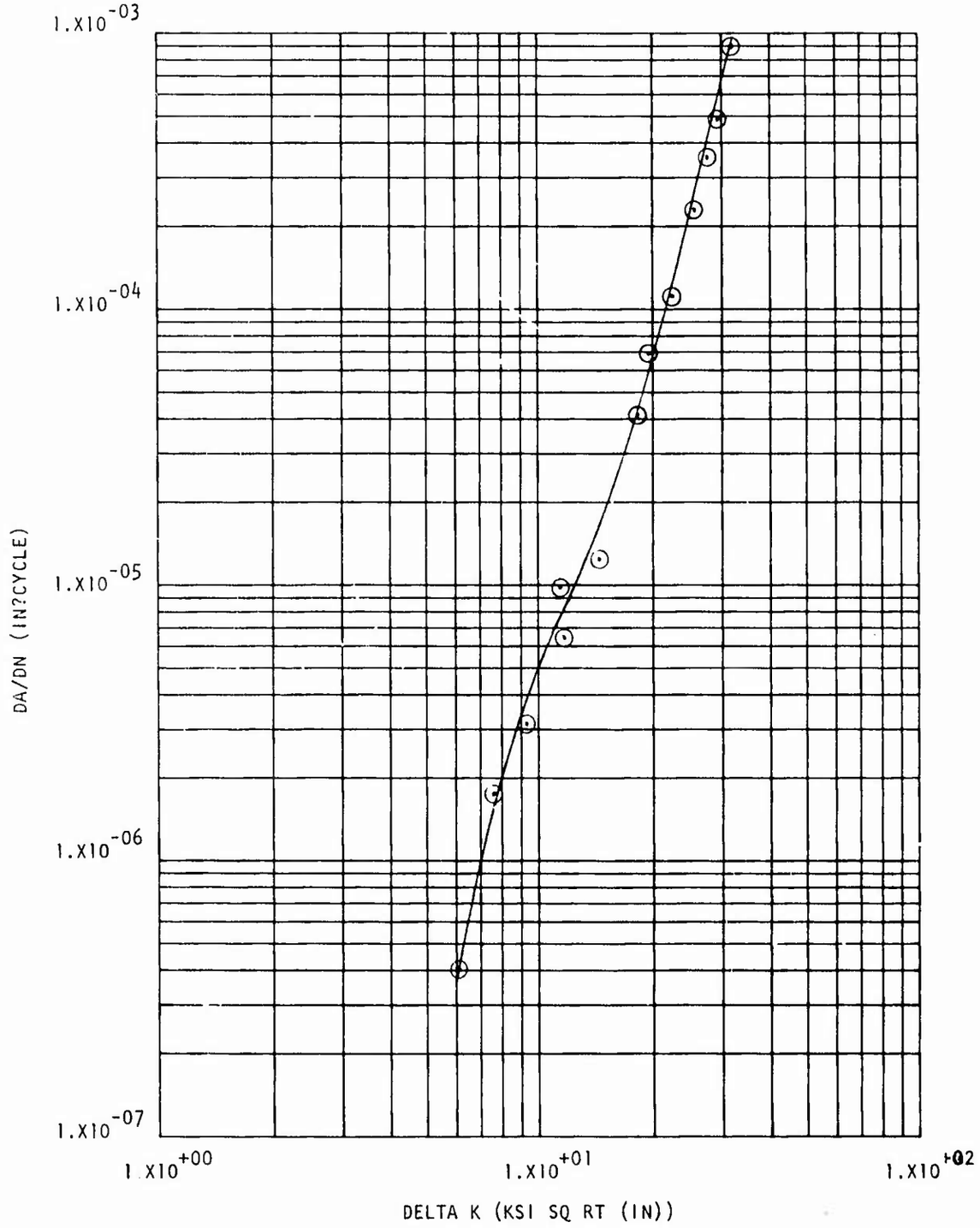

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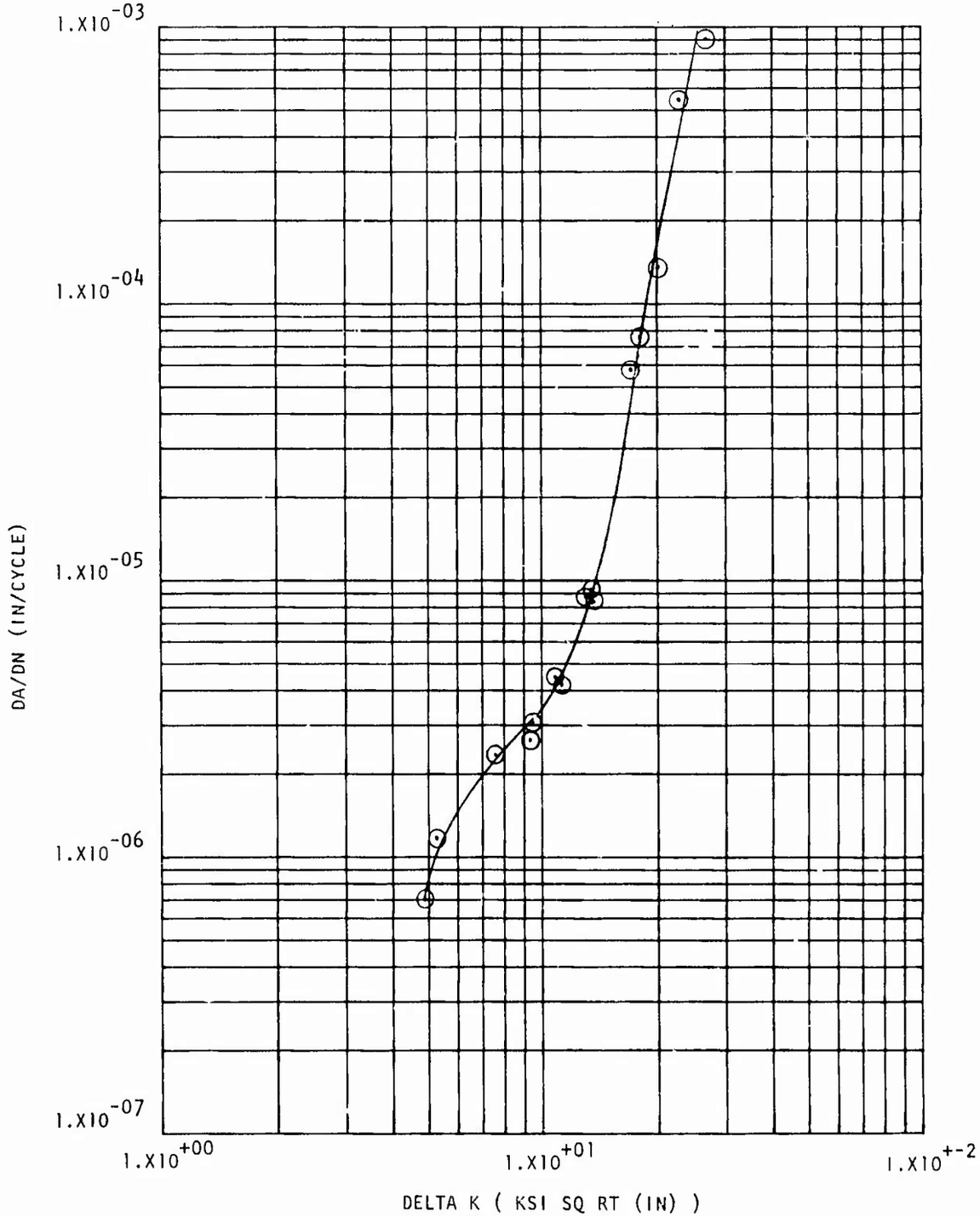

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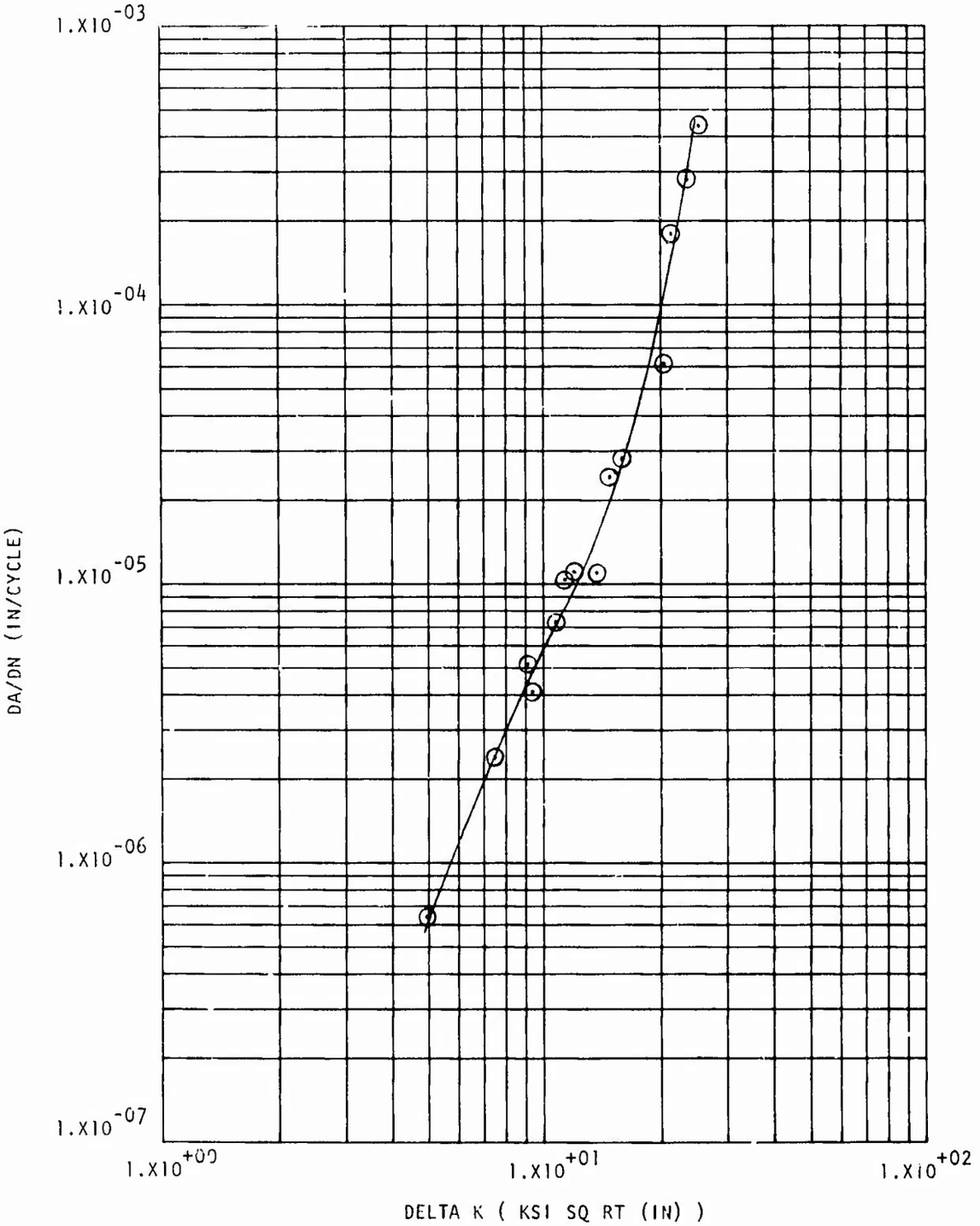

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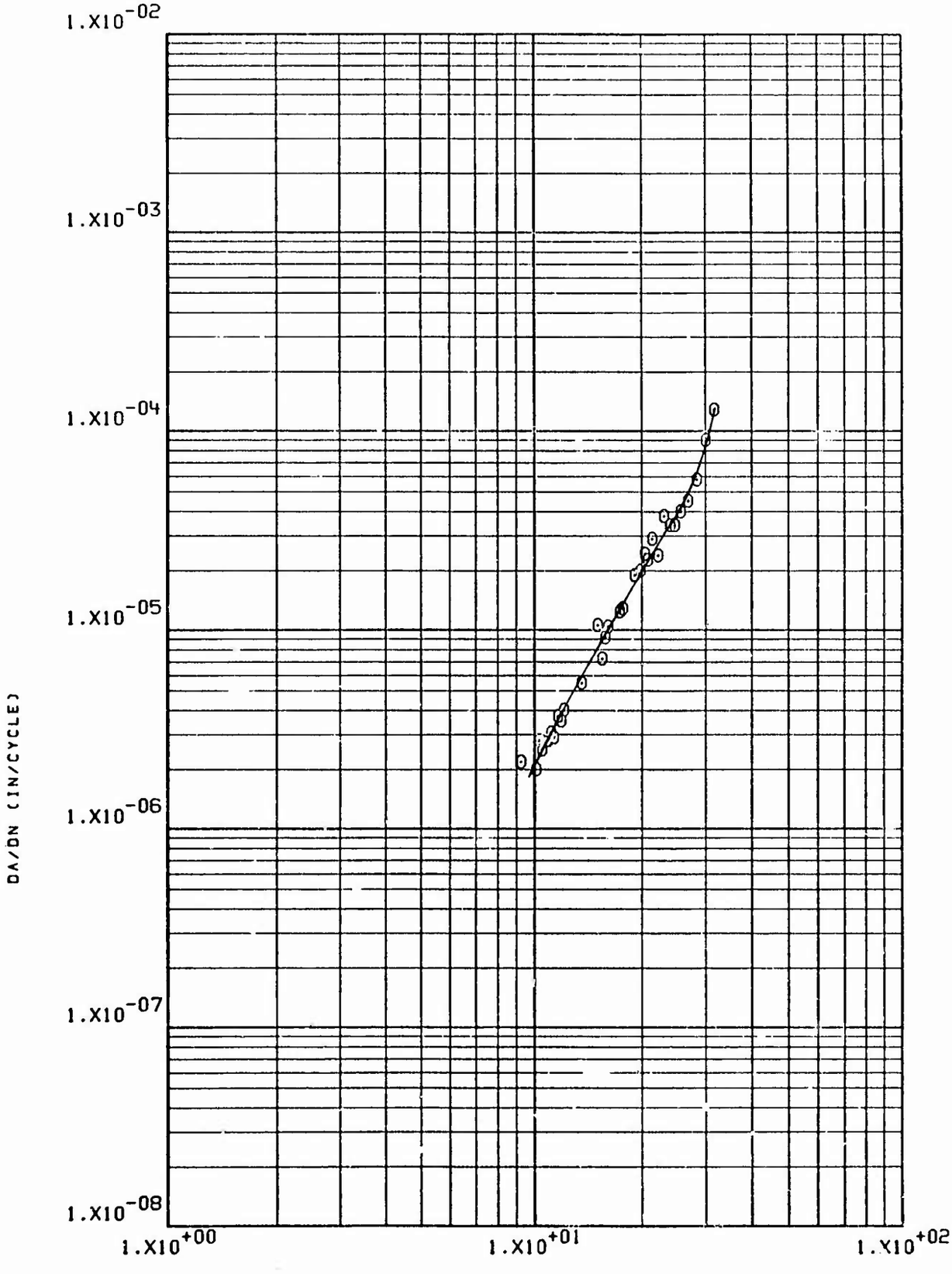
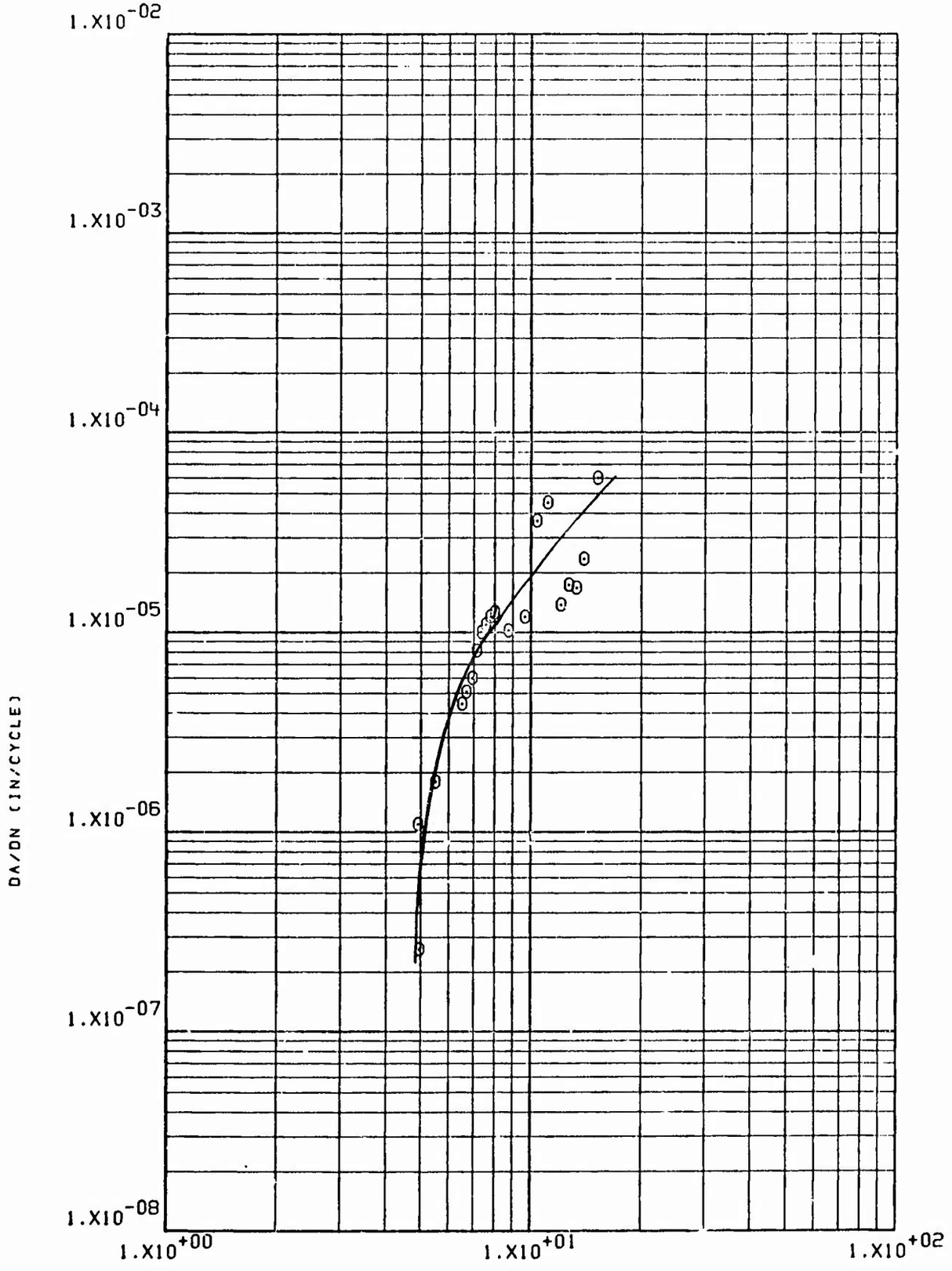
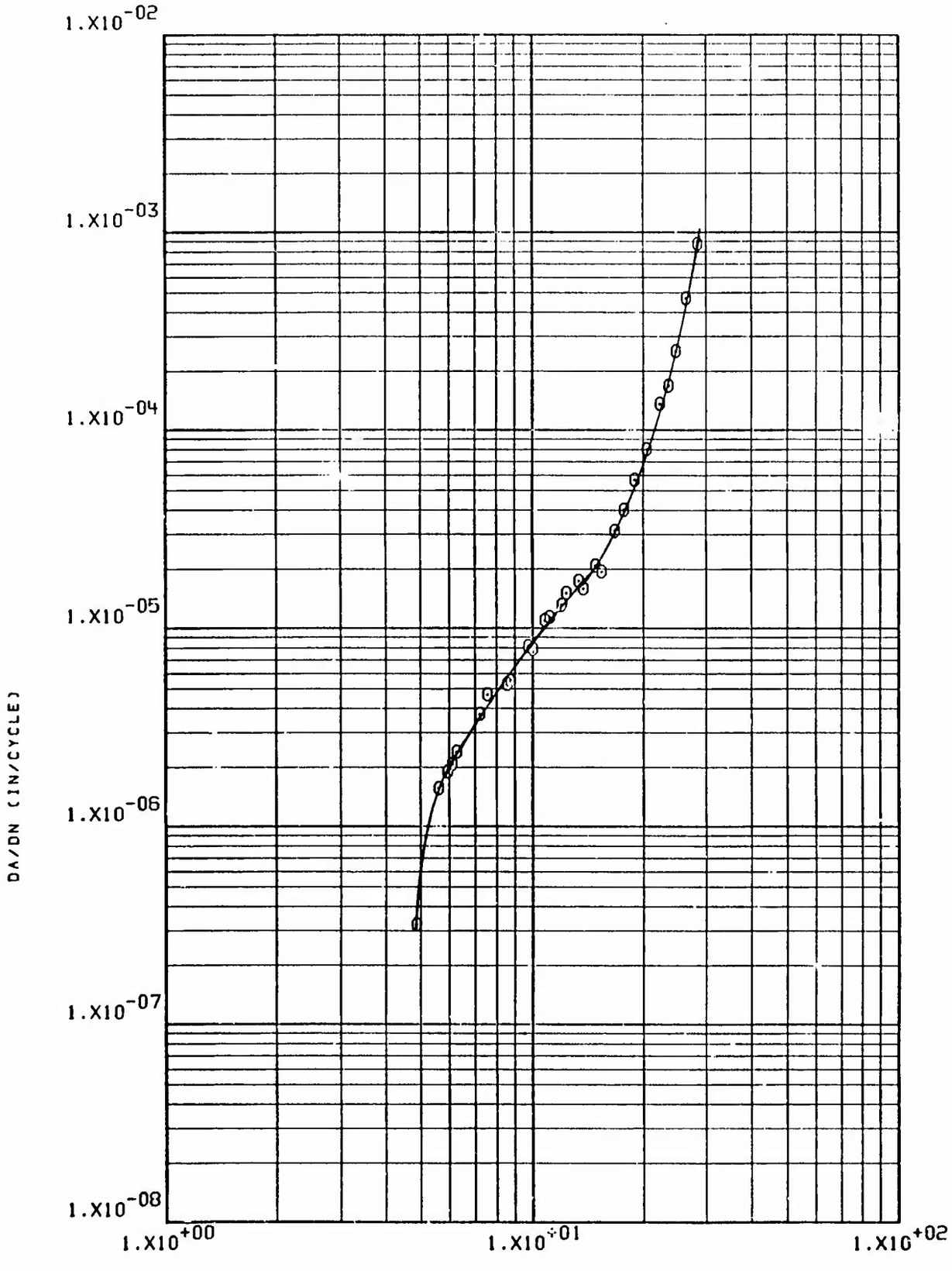


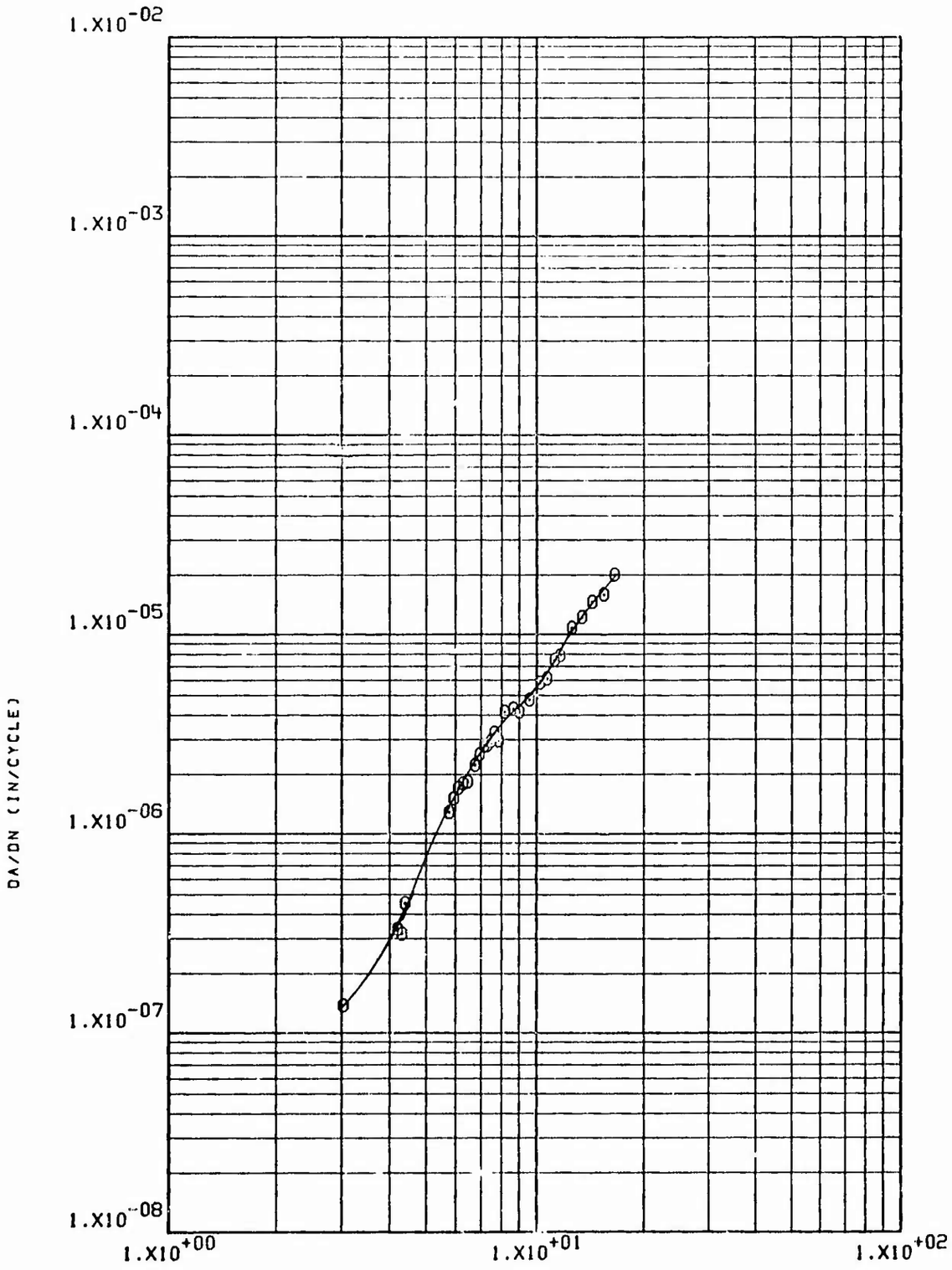
304 NRW 89-6 2219-T851 LHA R.T. R=.08 360CPM



309 NRW 96-6 7075-T76511 STW RT R=.08 60CPM



309 NRW 96-7 7075-T76511 LHA RT R=.3 360CPM



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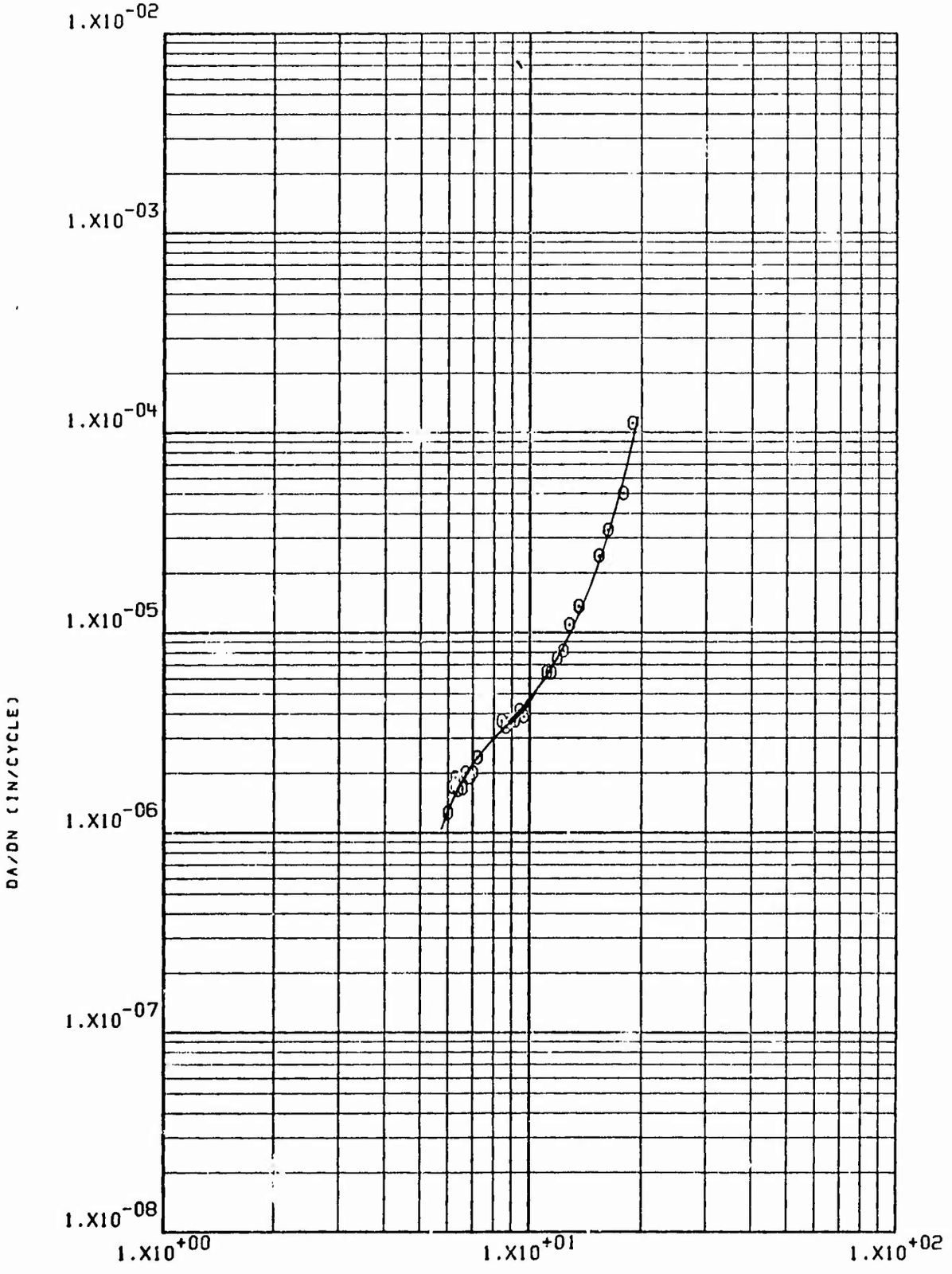
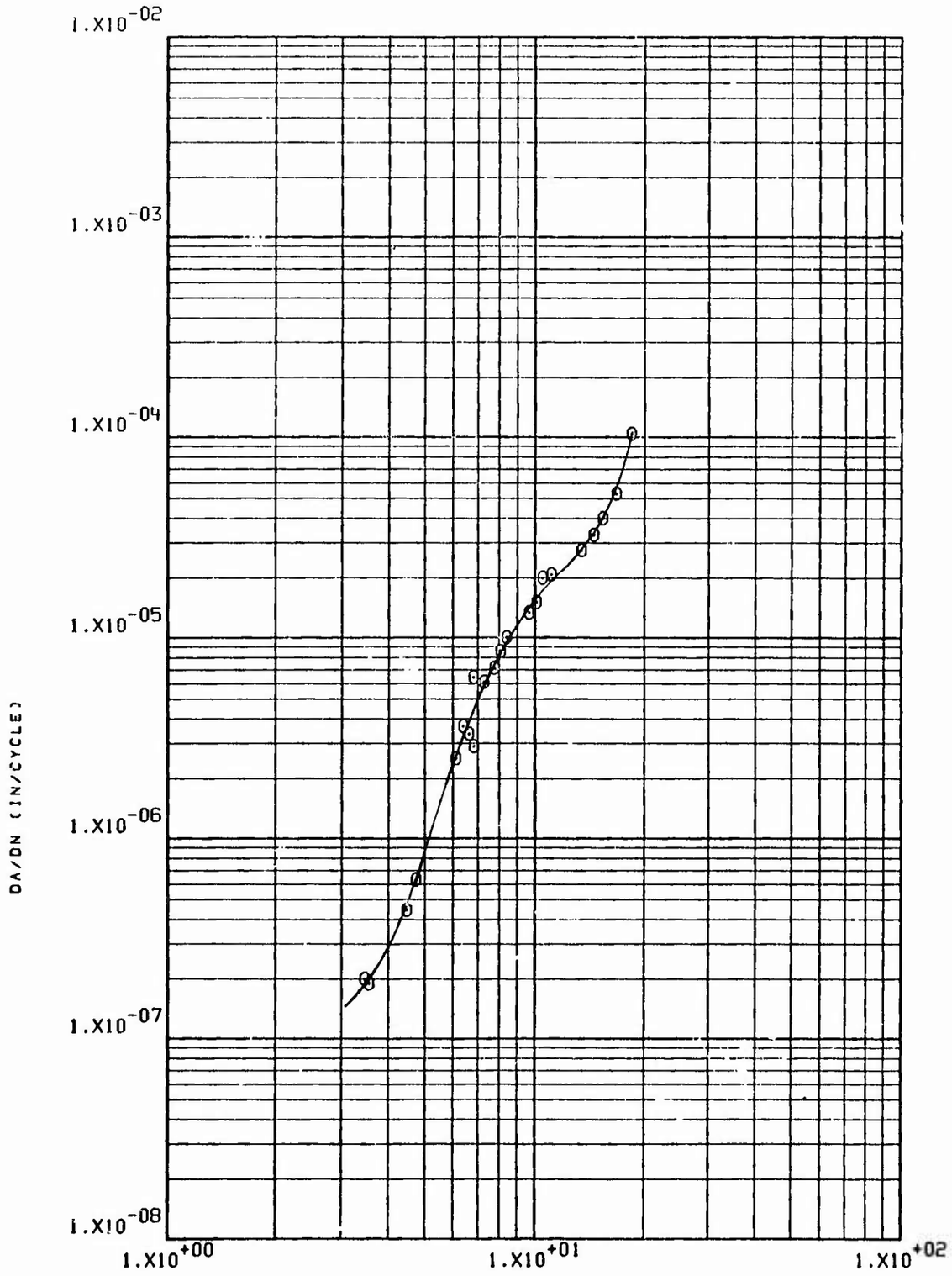
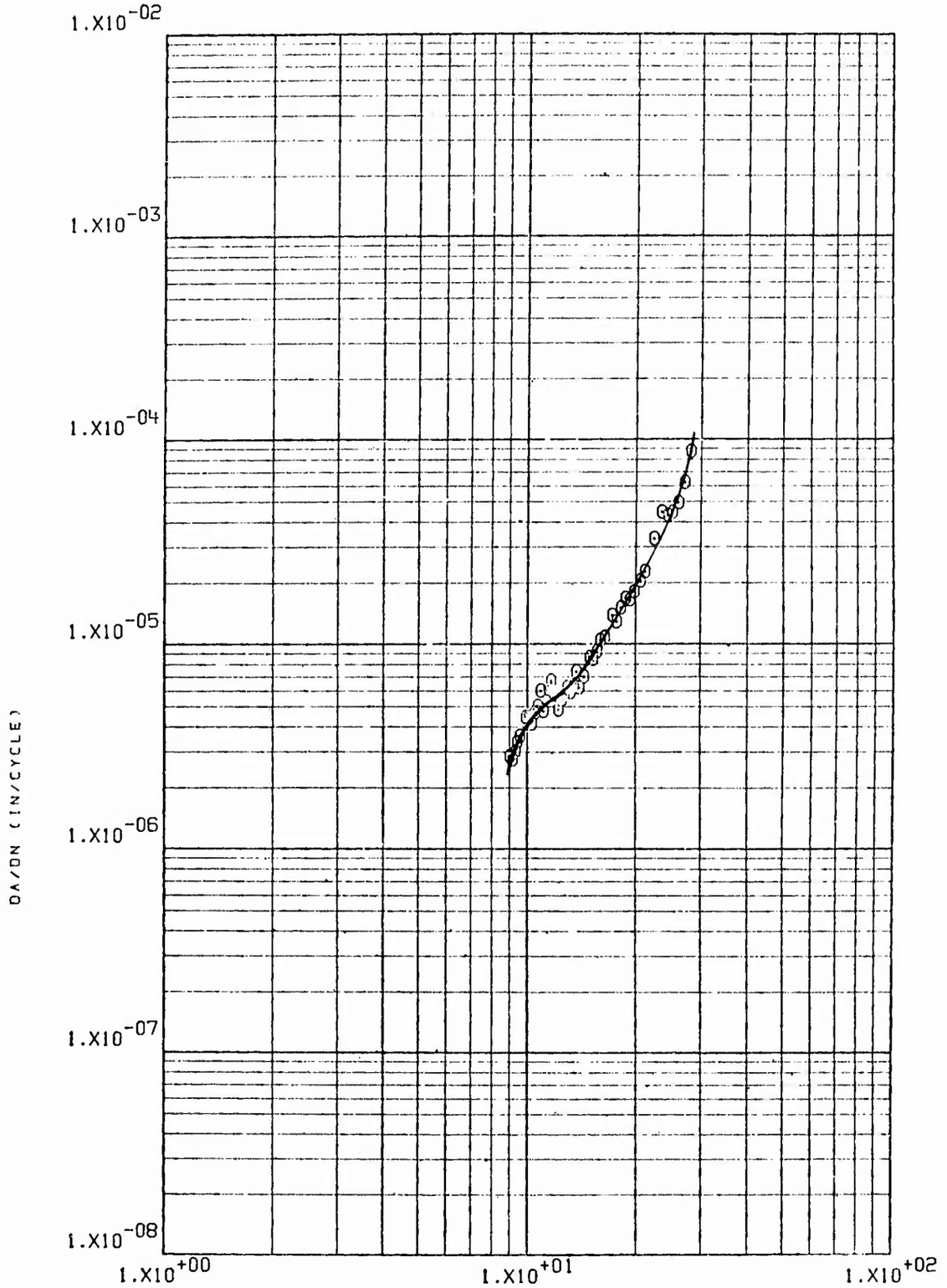


309 NWR 96-9 7075-T76511 LHA RT R=.08 360CPM



311 NWR 100-1 7075-T73511 EXTRUSION SUMP RT R=.08 60CPM



314 NRW 110-1 2219-T851 DPY AIR RT R=.08 360 CPM

LOS ANGELES DIVISION
NORTH AMERICAN ROCKWELL CORPORATION

APPENDIX C

FATIGUE CRACK GROWTH RATE CURVES

FOR ALL STEEL AND INCONEL 718 TESTS

(EXCLUDING WELDMENTS)

APPENDIX - INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No.
HP-9-4-.30 H.T.	32 NRW 1-57	RW	5.0	0.6	1.0	LHA	R.T.	0.08	60	C-1
" "	32 NRW 1-60	RW	5.0	0.6	1.0	STW	R.T.	0.08	60	C-2
" "	32 NRW 1-61	RW	5.0	0.6	1.0	LHA	R.T.	0.3	360	C-3
" "	32 NWR 1-63	WR	5.0	0.6	1.0	LHA	R.T.	0.08	360	C-4
" "	32 NRW 2-58	RW	5.0	0.6	1.0	LHA	R.T.	0.08	360	C-5
EP-9-4-.20 H.T.	33 NWR 14-2	WR	6.0	0.6	1.0	LHA	-65	0.08	60	C-6
" "	33 NRW 14-6	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	C-7
" "	33 NRW 14-8	RW	6.0	0.6	1.0	LHA	R.T.	0.08	60	C-8
" "	33 NRW 15-3	RW	6.0	0.6	1.0	100% HUM	R.T.	0.08	60	C-9
" "	33 NRW 15-6	RW	6.0	0.6	1.0	LHA	R.T.	0.5	360	C-10
" "	33 NRW 15-11	RW	6.0	0.6	1.0	LHA	R.T.	0.3	360	C-11
" "	33 NRW 15-12	RW	6.0	0.6	1.0	LHA	-65	0.08	60	C-12
" "	33 NRW 15-26	RW	7.4	0.486	1.0	100% HUM	R.T.	0.5	60	C-13
" "	33 NRW 15-27	RW	7.4	0.486	1.0	100% HUM	R.T.	0.3	60	C-14
" "	33 NRW 15-28	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-15
" "	33 NWR 66	WR	5.8	0.619	1.0	LHA	R.T.	0.05	60	C-16
" "	33 NRW 67	RW	6.0	0.6	1.0	LHA	R.T.	0.05	60	C-17
HP-9-4-.30 H.T.	35 NRW 20-1	RW	7.4	0.486	1.0	STW	R.T.	0.08	6	C-18
" "	35 NRW 20-3	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	C-19
" "	35 NRW 20-4	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	C-20
" "	35 NRW 20-6	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	C-21
" "	35 NRW 20-7	RW	7.4	0.486	1.0	LHA	-65	0.08	360	C-22
" "	35 NWR 20-8	WR	7.4	0.486	0.75	STW	R.T.	0.08	60	C-23
" "	35 NRW 20-9	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	C-24
" "	35 NRW 20-10	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	C-25
" "	35 NRW 20-11	RW	7.4	0.486	0.75	STW	R.T.	0.5	60	C-26
" "	35 NRW 20-12	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-27
" "	35 NRW 20-13	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	C-28
" "	35 NRW 20-14	RW	7.4	0.486	0.75	STW	R.T.	0.08	6	C-29
" "	35 NRW 20-15	RW	7.4	0.486	1.0	LHA	R.T.	0.08	6	C-30
" "	35 NWR 20-16	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	C-31
" "	35 NWR 20-18	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-32

Note: All figures on this page are for CT specimens.

APPENDI : INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environ-ment	Test Temp	"R"	Freq (CPM)	Page No.
PH 13-8Mo H1000	36 NRW 24-1	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	C-33
" "	36 NRW 24-2	RW	6.0	0.6	1.0	LHA	R.T.	0.3	360	C-34
" "	36 NRW 24-3	RW	6.0	0.6	1.0	STW	R.T.	0.08	60	C-35
" "	36 NRW 24-4	RW	6.0	0.6	1.0	LHA	R.T.	0.5	360	C-36
" "	36 NRW 24-5	RW	6.0	0.6	1.0	STW	R.T.	0.3	60	C-37
" "	36 NWR 24-8	WR	6.0	0.6	1.0	STW	R.T.	0.08	60	C-38
HP-9-4- .20 H.T.	37 NRW 30-2	RW	7.4	0.486	0.850	100% HUM	R.T.	0.08	6	C-39
" "	37 NRW 30-3	RW	6.0	0.6	0.825	LHA	R.T.	0.08	360	C-40
" "	37 NRW 30-4	RW	7.4	0.486	1.0	STW	R.T.	0.08	6	C-41
" "	37 NRW 30-7	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-42
" "	37 NRW 30-8	RW	7.4	0.486	1.0	LHA	-65	0.08	60	C-43
" "	37 NRW 30-9	RW	7.4	0.486	1.0	100% HUM	R.T.	0.08	60	C-44
" "	37 NRW 30-12	RW	7.4	0.486	1.0	Dist. H_2O	R.T.	0.08	6	C-45
" "	37 NRW 30-13	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-46
" "	37 NWR 30-14	WR	7.4	0.486	1.0	LHA	R.T.	0.08	60&360	C-47
" "	37 NWR 30-15	WR	6.0	0.6	1.0	LHA	-65	0.08	60	C-48
" "	37 NWR 31-1	WR	7.4	0.486	1.0	LHA	-65	0.08	60	C-49
" "	37 NWR 31-2	WR	7.4	0.486	1.0	LHA	R.T.	0.08	60	C-50
" "	37 NRW 31-5	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-51
" "	37 NRW 31-6	RW	7.4	0.486	1.0	STW	R.T	0.08	60	C-52
" "	37 NRW 31-7	RW	7.4	0.486	1.0	LHA	-65	0.08	60	C-53
300M H.T.	39 NRW 55-7	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-54
" "	39 NRW 55-8	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	C-55
" "	39 NRW 55-9	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	C-56
" "	39 NRW 55-10	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	C-57
" "	39 NRW 55-11	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	C-58
" "	39 NRW 55-12	RW	7.4	0.486	1.0	LHA	-65	0.08	360	C-59
" "	39 NRW 55-13	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	C-60
" "	39 NRW 55-14	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	C-61
" "	39 NRW 55-16	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	C-62
" "	39 NWR 55-17	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-63
" "	39 NWR 55-18	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	C-64

Note: All figures on this page are for CT specimens.

APPENDIX C: INDEX OF FIGURES

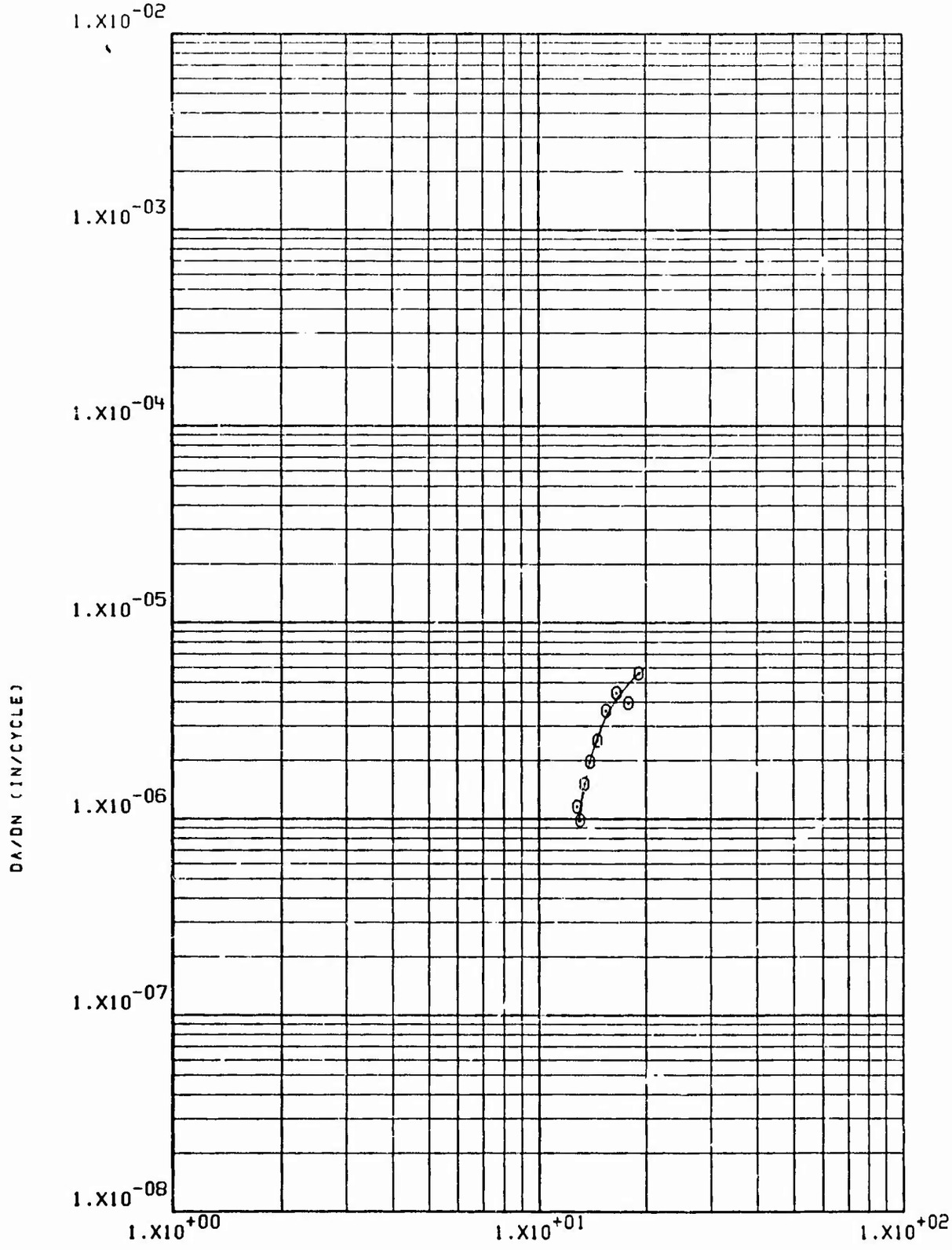
Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No.
300M H.T.	39 NTR 55-34	TR	3.09	0.471	1.0	STW	R.T.	0.08	60	C-65
" "	39 NTR 55-35	TR	3.09	0.471	1.0	LHA	-65	0.08	360	C-66
" "	39 NTR 55-36	TR	3.09	0.471	1.0	LHA	R.T.	0.08	360	C-67
" "	39 NRW 55-70	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	C-68
" "	39 NRW 55-71	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	C-69
" "	39 NRW 55-72	RW	7.4	0.486	1.0	STW	R.T.	0.5	60	C-70
PH13-8Mo H1000	40 NWR 56-1	WR	7.4	0.486	0.5	LHA	R.T.	0.08	360	C-71
" "	40 NWR 56-2	WR	7.4	0.486	1.0	STW	R.T.	0.08	60	C-72
" "	40 NWR 56-3	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-73
" "	40 NWR 56-4	WR	7.4	0.486	1.0	LHA	-65	0.08	360	C-74
" "	40 NRW 56-5	RW	7.4	0.486	1.0	LHA	R.T.	0.08	6	C-75
" "	40 NRW 56-6	RW	7.4	0.486	1.0	LHA	R.T.	0.08	60	C-76
" "	40 NRW 56-7	RW	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-77
" "	40 NRW 56-8	RW	7.4	0.486	1.0	LHA	-65	0.08	360	C-78
" "	40 NRW 56-9	RW	7.4	0.486	1.0	STW	R.T.	0.08	60	C-79
" "	40 NRW 56-10	RW	7.4	0.486	1.0	STW	R.T.	0.08	6	C-80
" "	40 NRW 56-11	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	C-81
" "	40 NRW 56-12	RW	7.4	0.486	1.0	LHA	R.T.	0.5	360	C-82
" "	40 NRW 56-13	RW	7.4	0.486	0.5	LHA	R.T.	0.08	360	C-83
" "	40 NRW 56-14	RW	7.4	0.486	0.25	LHA	R.T.	0.08	360	C-84
" "	40 NRW 56-15	RW	7.4	0.486	1.0	STW	R.T.	0.3	60	C-85
" "	40 NRW 56-16	RW	7.4	0.486	1.0	LHA	R.T.	0.3	360	C-86
" "	40 NRW 56-17	RW	7.4	0.486	1.0	SCS	R.T.	0.08	60	C-87
PH13-8Mo H1000	41 NRW 57-1	RW	6.0	0.6	1.0	LHA	-65	0.08	360	C-88
" "	41 NRW 57-2	RW	6.175	0.486	1.0	LHA	R.T.	0.08	360	C-89
" "	41 NRW 57-4	RW	6.175	0.486	1.0	LHA	R.T.	0.5	360	C-90
" "	41 NRW 57-8	RW	6.175	0.486	1.0	LHA	R.T.	0.08	360	C-91
" "	41 NRW 57-11	RW	6.175	0.486	1.0	LHA	R.T.	0.5	360	C-92
" "	41 NRW 57-13	RW	6.175	0.486	1.0	STW	R.T.	0.08	60	C-93
" "	41 NRW 57-14	RW	6.175	0.486	1.0	LHA	R.T.	0.08	360	C-94
" "	41 NWR 57-16	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-95
" "	41 NWR 57-21	WR	7.4	0.486	1.0	LHA	R.T.	0.08	360	C-96

NOTE: All figures on this page are for CT Specimens.

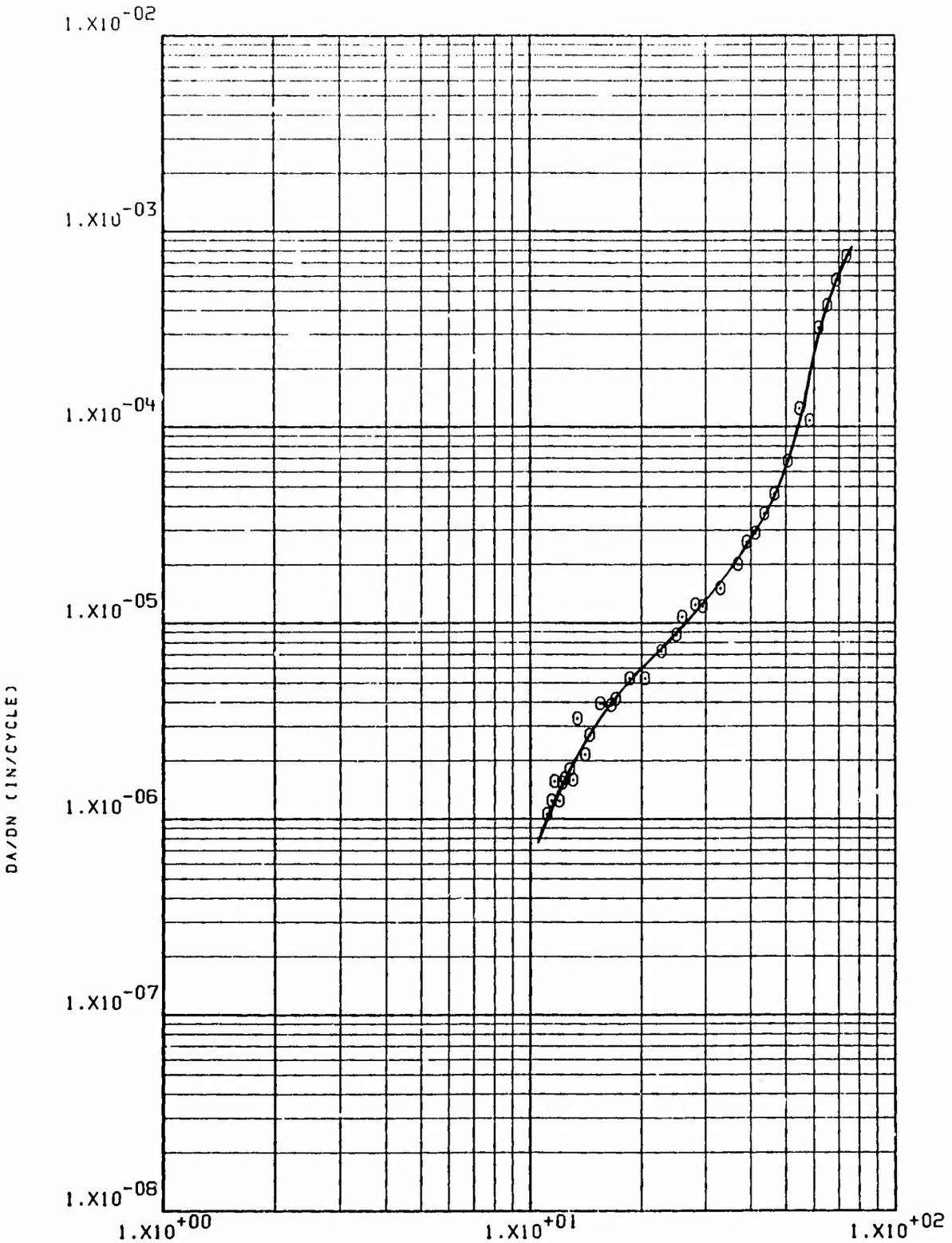
APPENDIX C - INDEX OF FIGURES

Alloy & Condition	Figure No. (Specimen No.)	Direction	"W"	"H/W"	"t"	Environment	Test Temp	"R"	Freq (CPM)	Page No.
HP-9-4-.20 H.T.	43 NWR 60-1	WR	6.0	0.6	0.5	LHA	R.T.	0.08	360	C-97
" "	43 NRW 60-3	RW	6.0	0.6	1.0	LHA	R.T.	0.08	60	C-98
" "	43 NRW 60-5	RW	6.0	0.6	1.0	LHA	R.T.	0.08	540	C-99
" "	43 NRW 60-7	RW	6.0	0.6	1.0	LHA	R.T.	0.7	360	C-100
" "	43 NRW 60-51	RW	6.0	0.6	1.0	SCS	R.T.	0.08	60	C-101
" "	43 NRW 60-53	RW	6.0	0.6	1.0	100% HUM.	R.T.	0.08	6	C-102
" "	43 NRW 60-55	RW	6.0	0.6	1.0	STW	R.T.	0.08	60	C-103
" "	43 NRW 60-57	RW	6.0	0.6	1.0	LHA	R.T.	0.08	6	C-104
" "	43 NRW 60-59	RW	6.0	0.6	0.5	LHA	R.T.	0.08	360	C-105
" "	43 NRW 60-61	RW	6.0	0.6	0.25	LHA	R.T.	0.08	360	C-106
PH13-8Mo H1000	44 NRW 62-8	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	C-107
" "	44 NWR 62-9	WR	5.0	0.486	1.0	LHA	R.T.	0.08	360	C-108
" "	44 NWR 62-10	WR	5.0	0.486	1.0	LHA	-65	0.08	360	C-109
HP-9-4-.20 H.T. (VIM/VAR)	46 NRW 73-7	RW	6.0	0.6	1.0	LHA	R.T.	0.08	360	C-110
	46 NRW 73-8	RW	6.0	0.6	1.0	100% HUM.	R.T.	0.08	60	C-111
" "	46 NWR 73-9	WR	6.0	0.6	1.0	LHA	R.T.	0.08	360	C-112
INCO 718 H.T.	51 NTR 82-19	TR	3.77	0.477	1.0	LHA	400	0.08	360	C-113
" "	51 NTR 82-20	TR	3.77	0.477	1.0	LHA	R.T.	0.08	360	C-114
" "	51 NTR 82-21	TR	3.77	0.477	1.0	STW	R.T.	0.08	60	C-115
" "	51 NWR 82-50	WR	7.4	0.486	0.5	LHA	R.T.	0.08	360	C-116
" "	51 NWR 82-51	WR	7.4	0.486	0.5	STW	R.T.	0.08	60	C-117
" "	51 NWR 82-52	WR	7.4	0.486	0.5	SCS	R.T.	0.08	60	C-118
" "	51 NRW 82-53	RW	6.0	0.6	0.5	LHA	400	0.08	360	C-119
" "	51 NRW 82-54	RW	6.0	0.6	0.5	LHA	400	0.5	360	C-120
" "	51 NRW 82-55	RW	6.0	0.6	0.5	LHA	R.T.	0.08	360	C-121
" "	51 NRW 82-56	RW	6.0	0.6	0.5	STW	R.T.	0.08	60	C-122
" "	51 NRW 82-57	RW	6.0	0.6	0.5	LHA	R.T.	0.5	360	C-123
INCO 718 H.T.	53 NWR 98-1	WR	6.0	0.6	0.5	LHA	R.T.	0.08	360	C-124
" "	53 NRW 98-2	RW	7.4	0.486	0.5	LHA	R.T.	0.5	360	C-125
" "	53 NRW 98-3	RW	7.4	0.486	0.5	LHA	R.T.	0.08	360	C-126

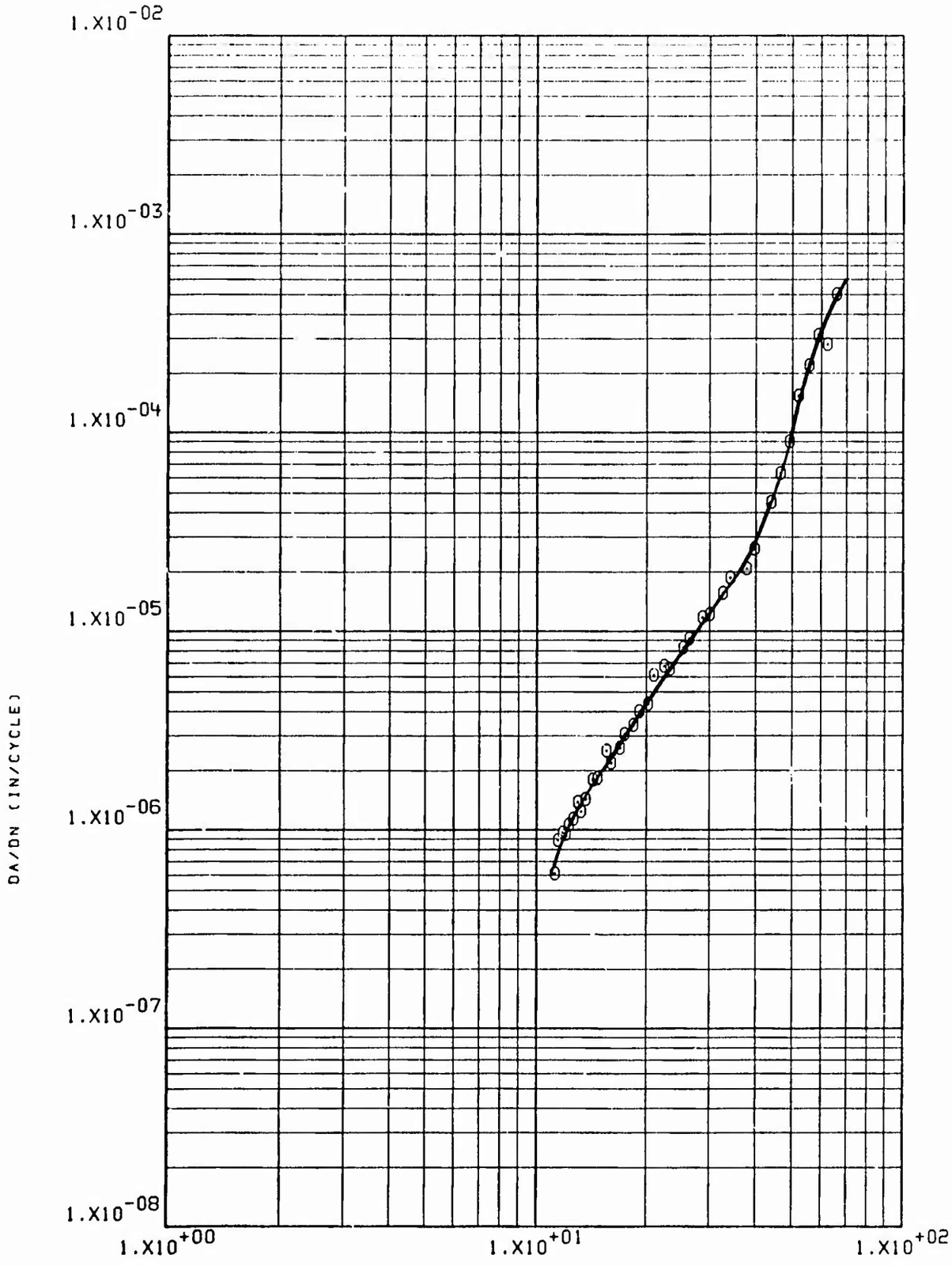
Note: All figures on this page are for compact tension specimens.



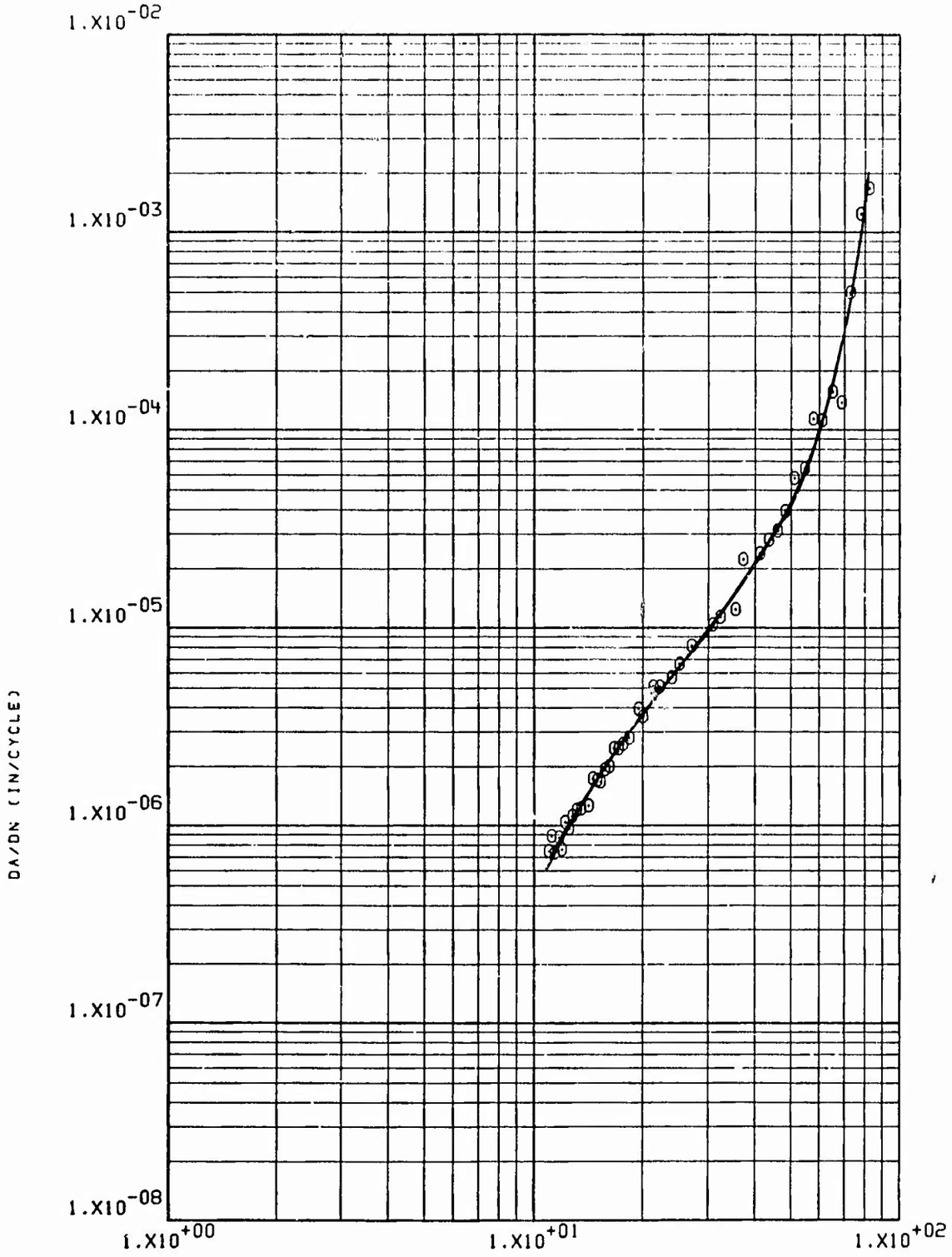
32 NRW 1-57 HP-9-4-.30 HT LHA RT R=.08 50 CPM



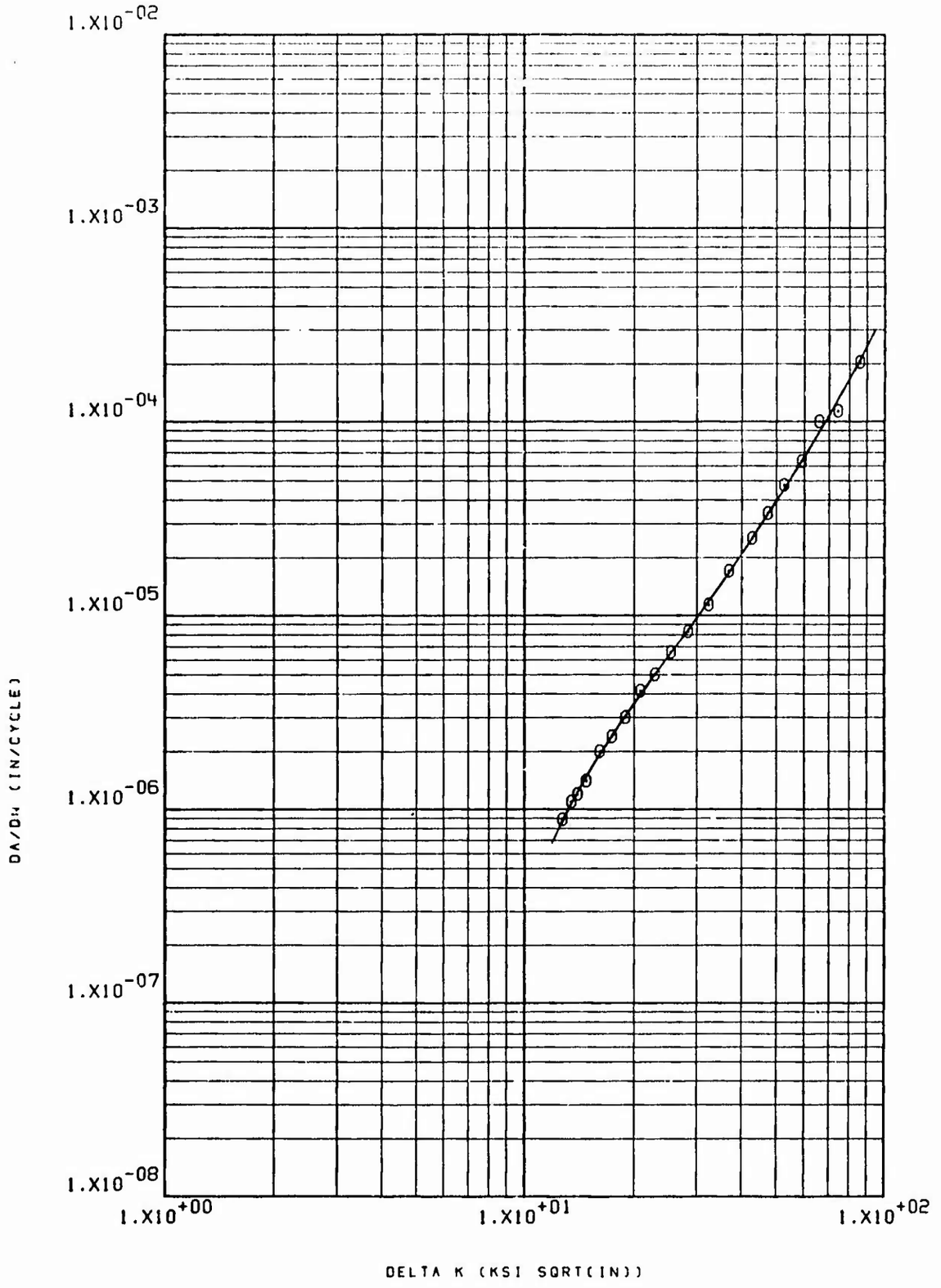
32 NRW 1-60 HP-9-4-.30 HT STW RT R=.08 60 CPM



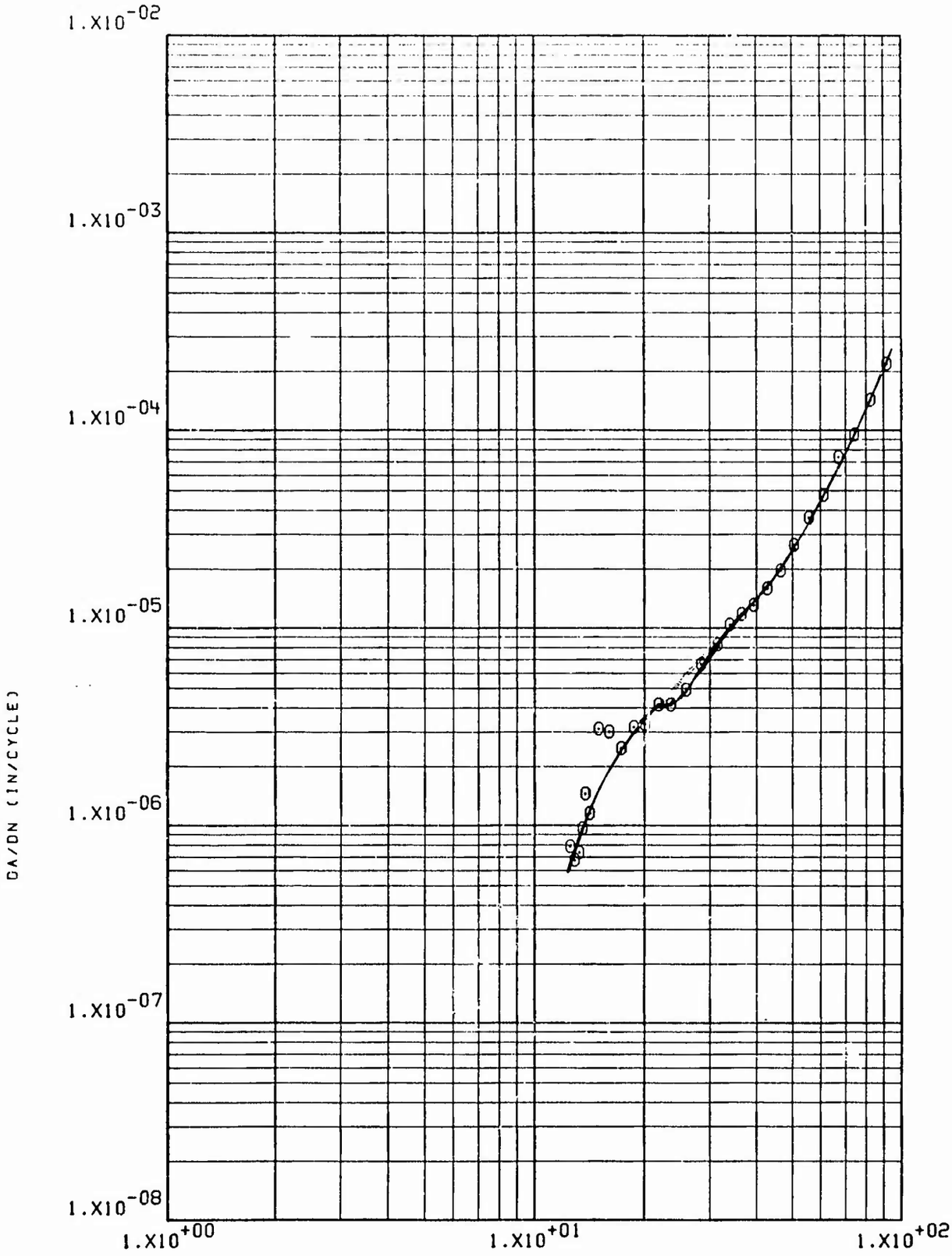
32 NRW 1-61 HP-9-4-.30 HT LHA RT R=.3 360CPM



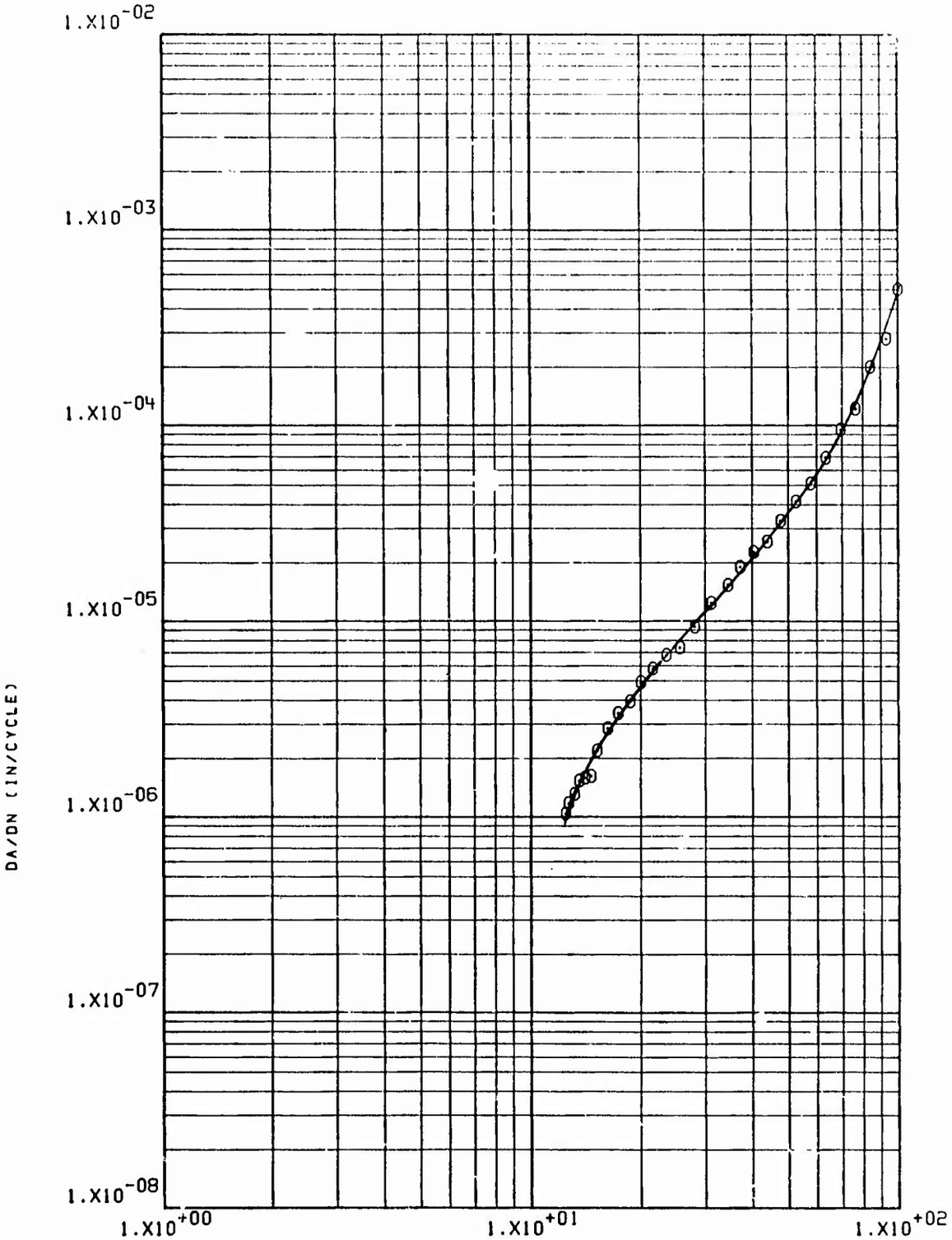
32 NWR 1-63 HP-9-4-.30 HT LHA RT R=.08 360CPM



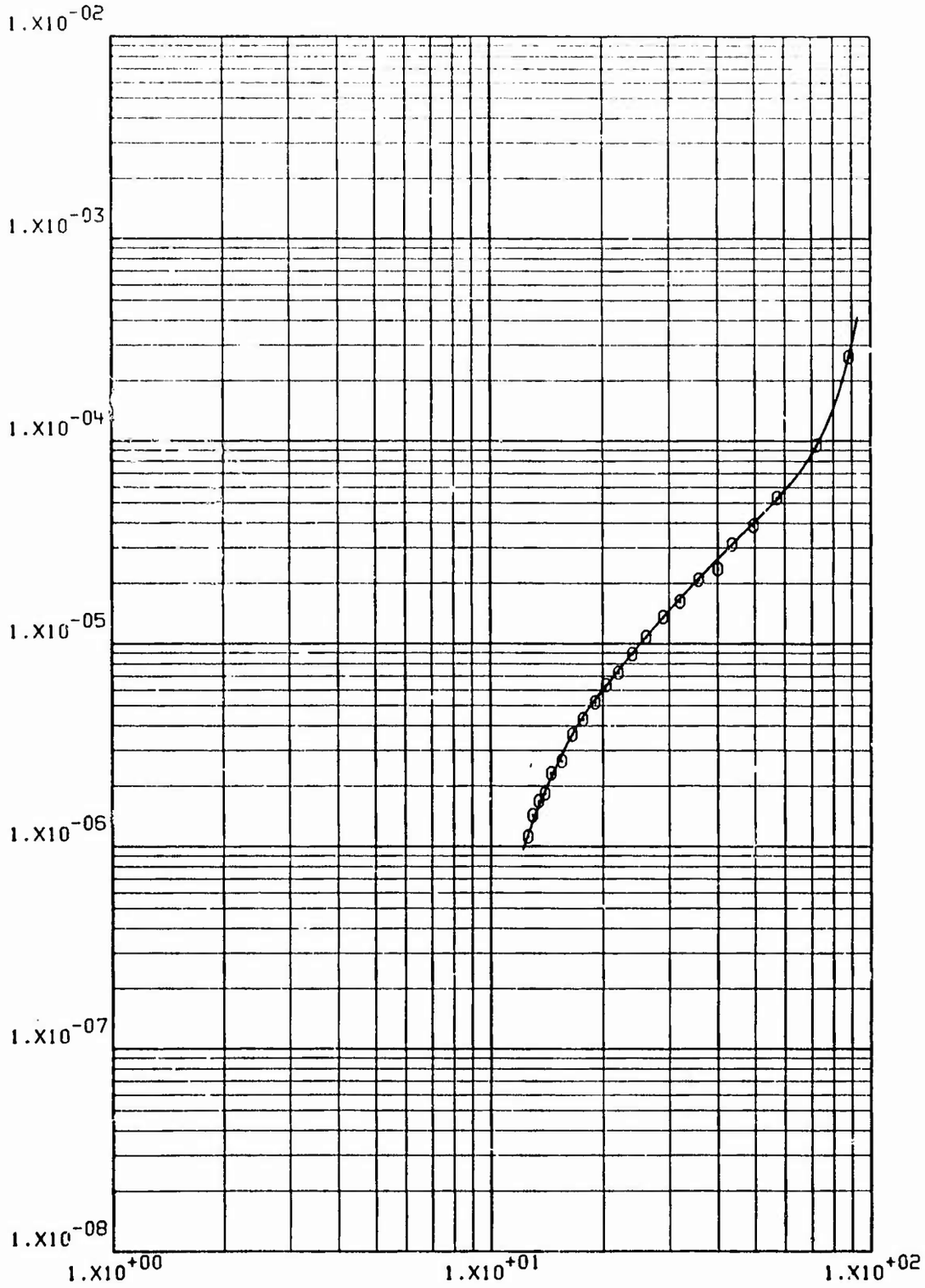
32 NRW 2-58 HP 9-4-.30 HT L.H.A. R.T. 360CPM R=.08



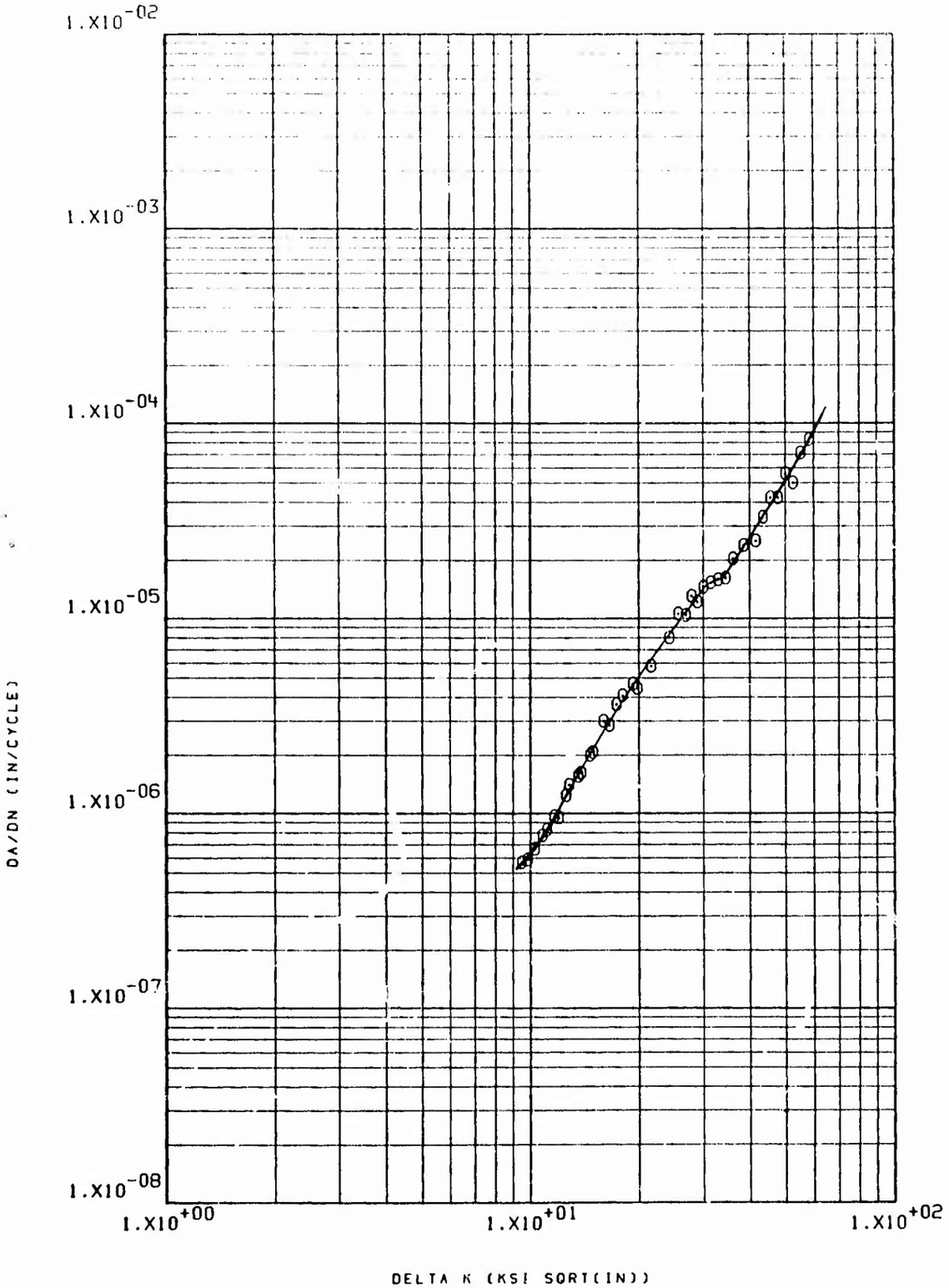
33 NWR 14-2 HP-9-4-.20 HT LHA -65F R=.08 60CPM



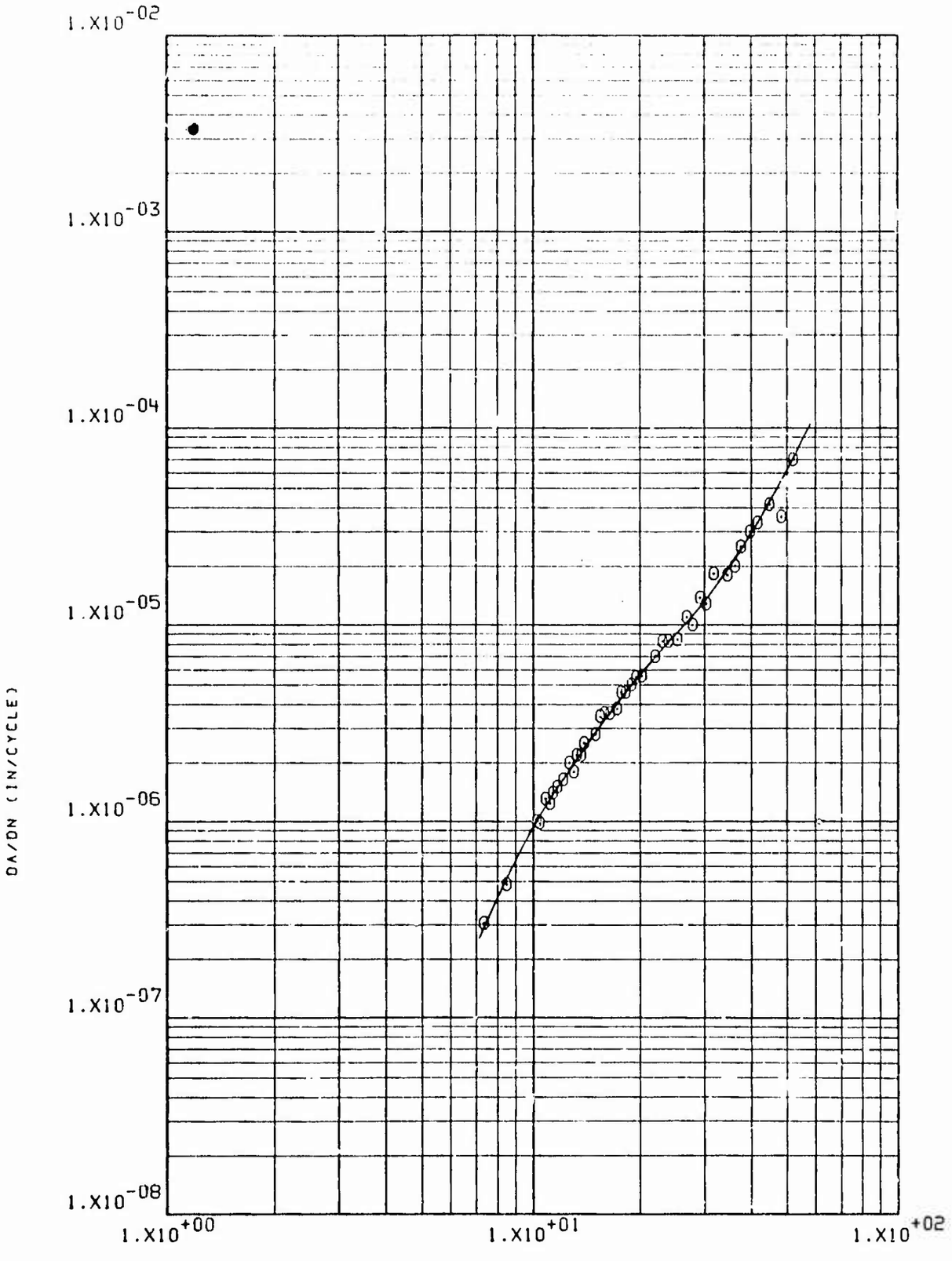
33 NRW 14-6 HP-9-4-.20 HT LHA RT R=.08 360CPM



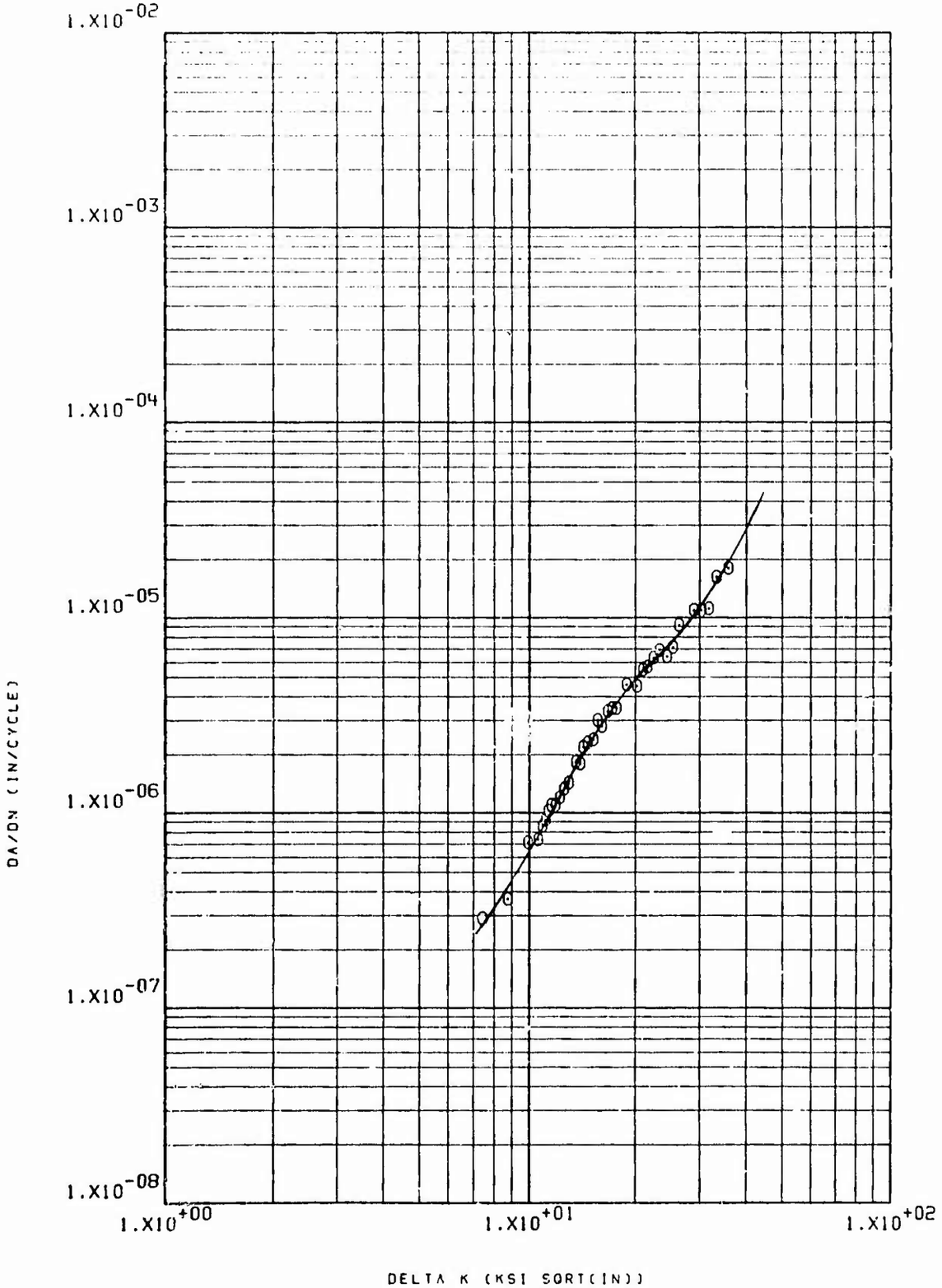
33 NRW 14-8 HP 9-4-.20 HT L.H.A. R.T. 60CPM R=.08



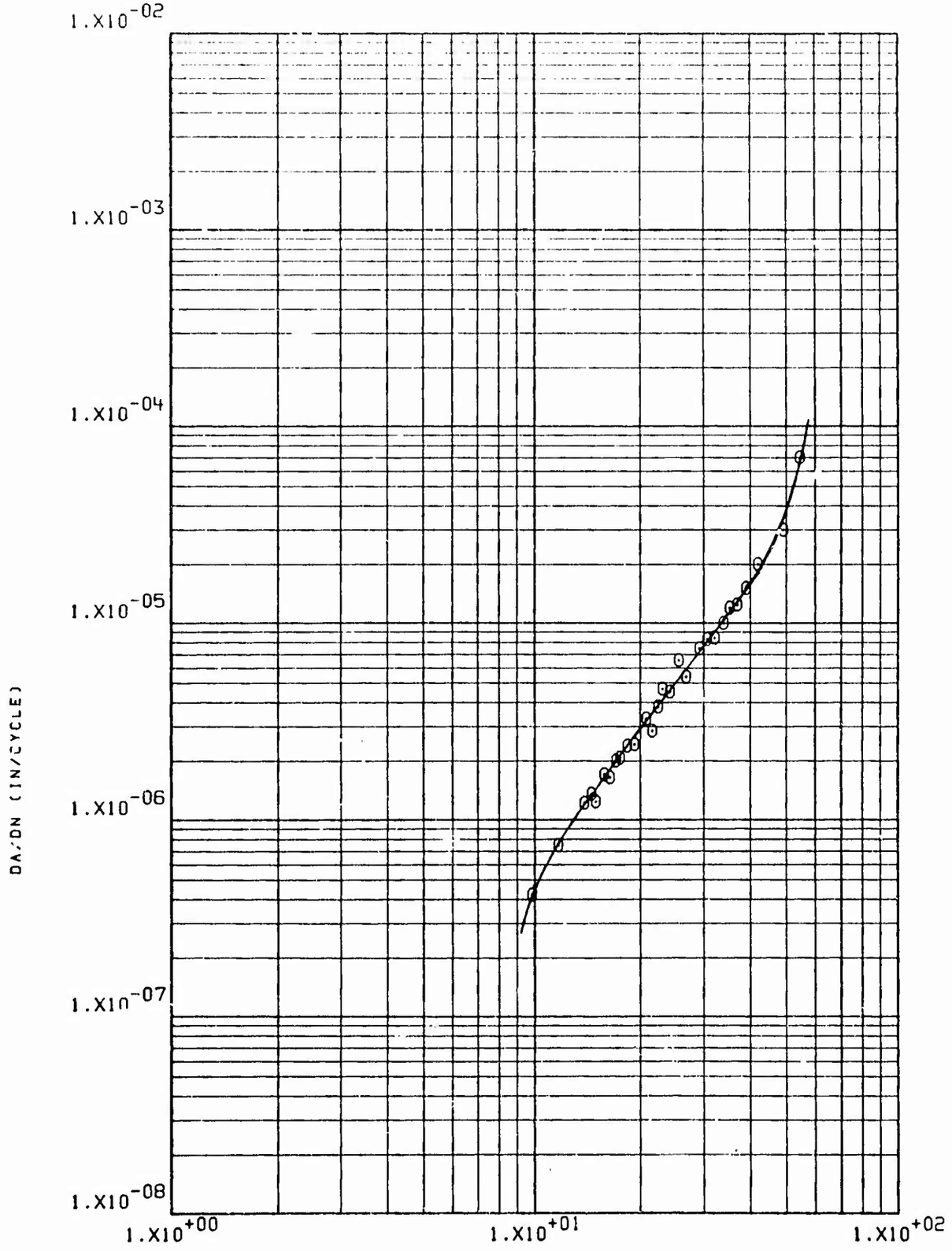
33 NRW 15-3 HP 9-4-.20 HT 100□HUMIDITY R.T. 60CPM R=.08



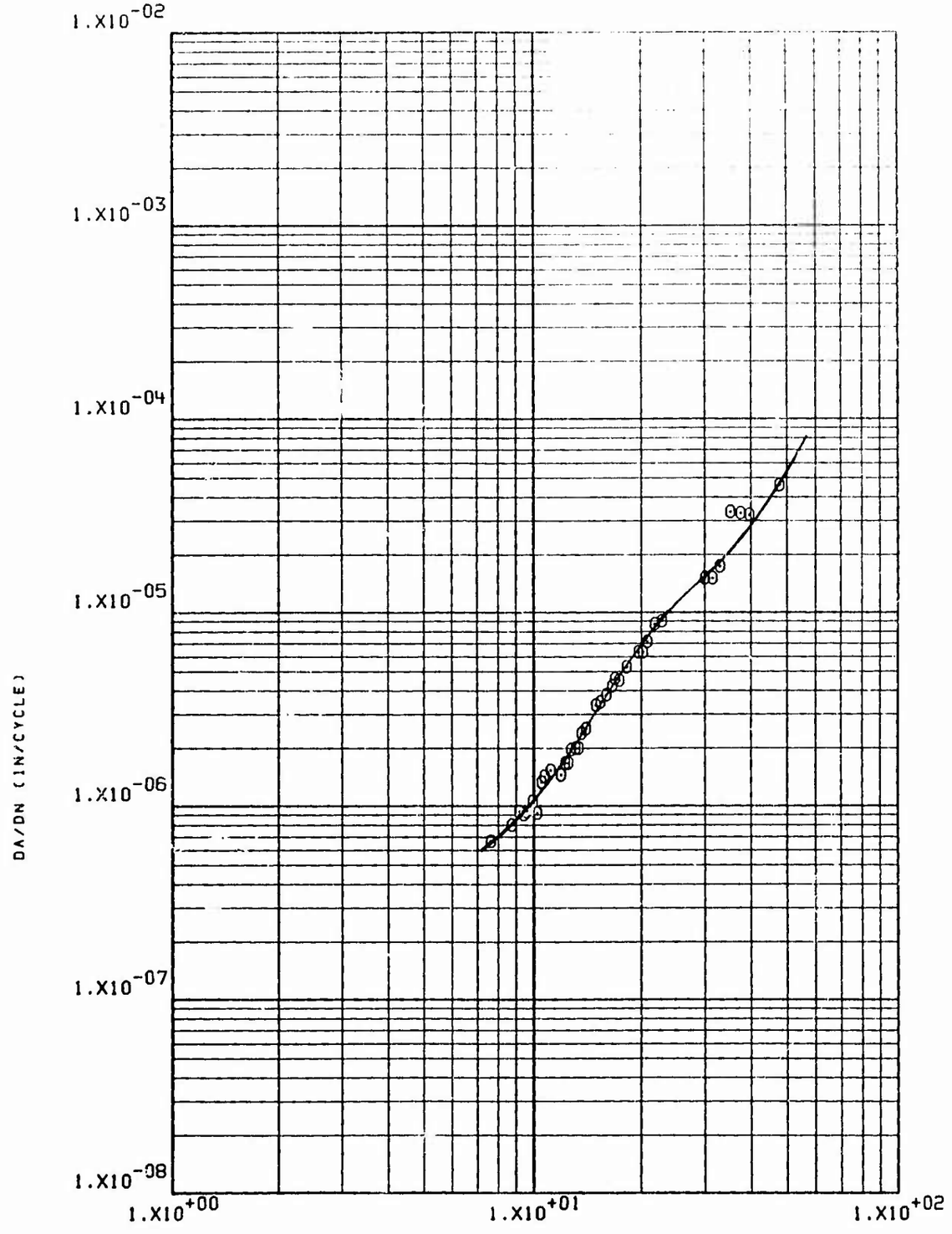
33 NRW 1S-6 HP 9-4-.20 HT L.H.A. R.T. 360CPM R=.5



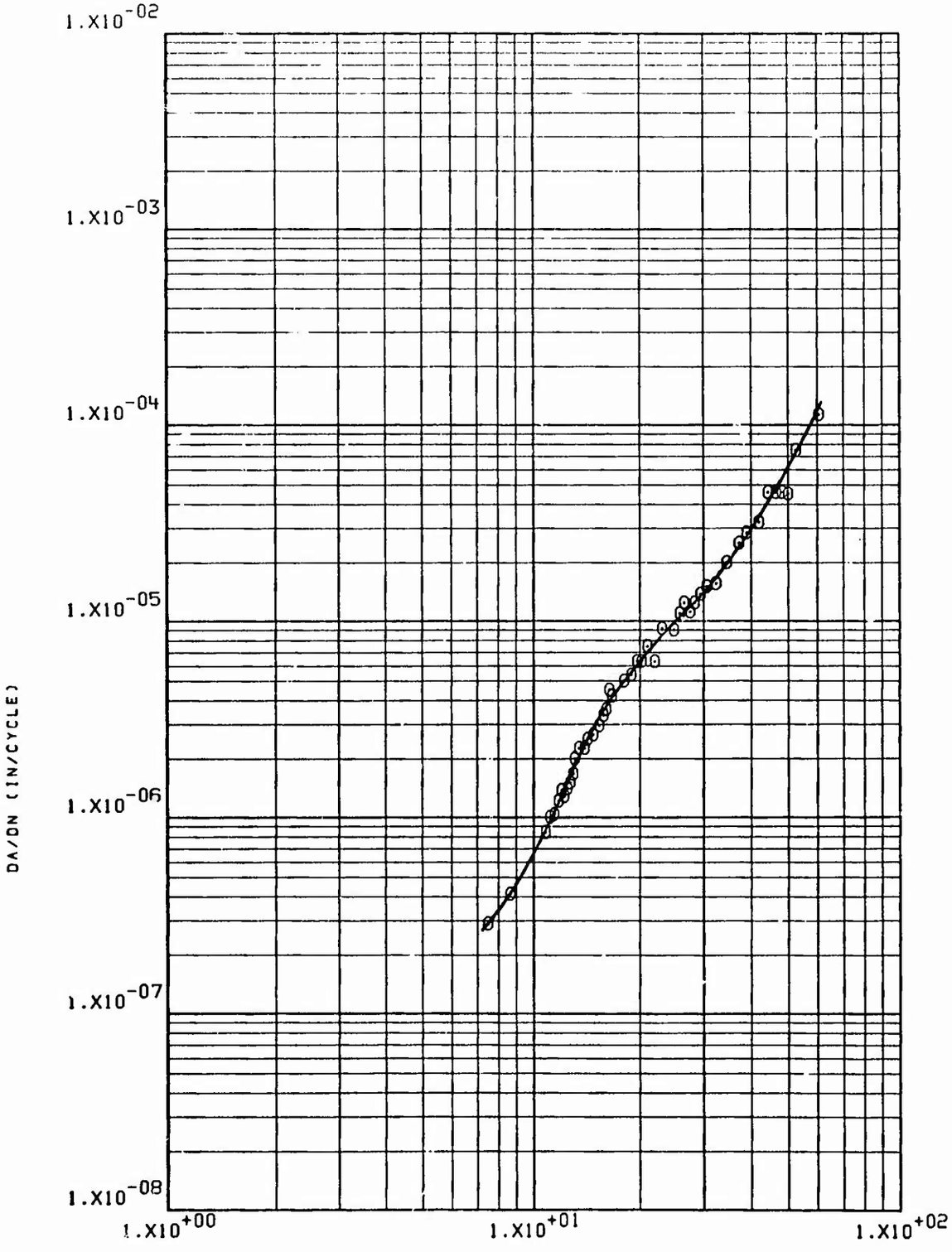
33 NRW 15-11 HP 9-4-.20 HT L.H.A. R.T. 360CPM R=.3



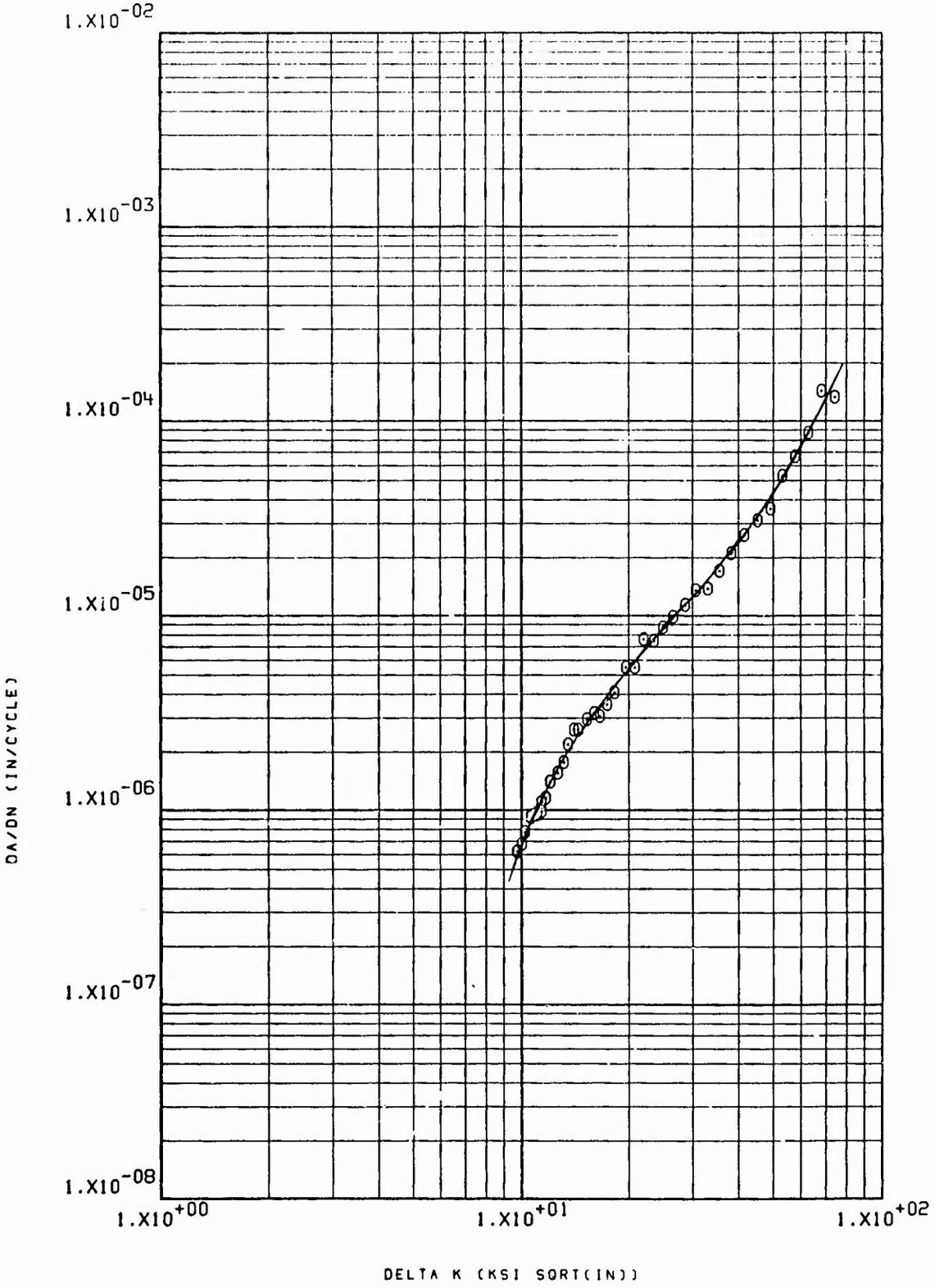
33 NRW 15-12 HP 9-4-.20 HT L.H.A. -65F 60CPM R=.08



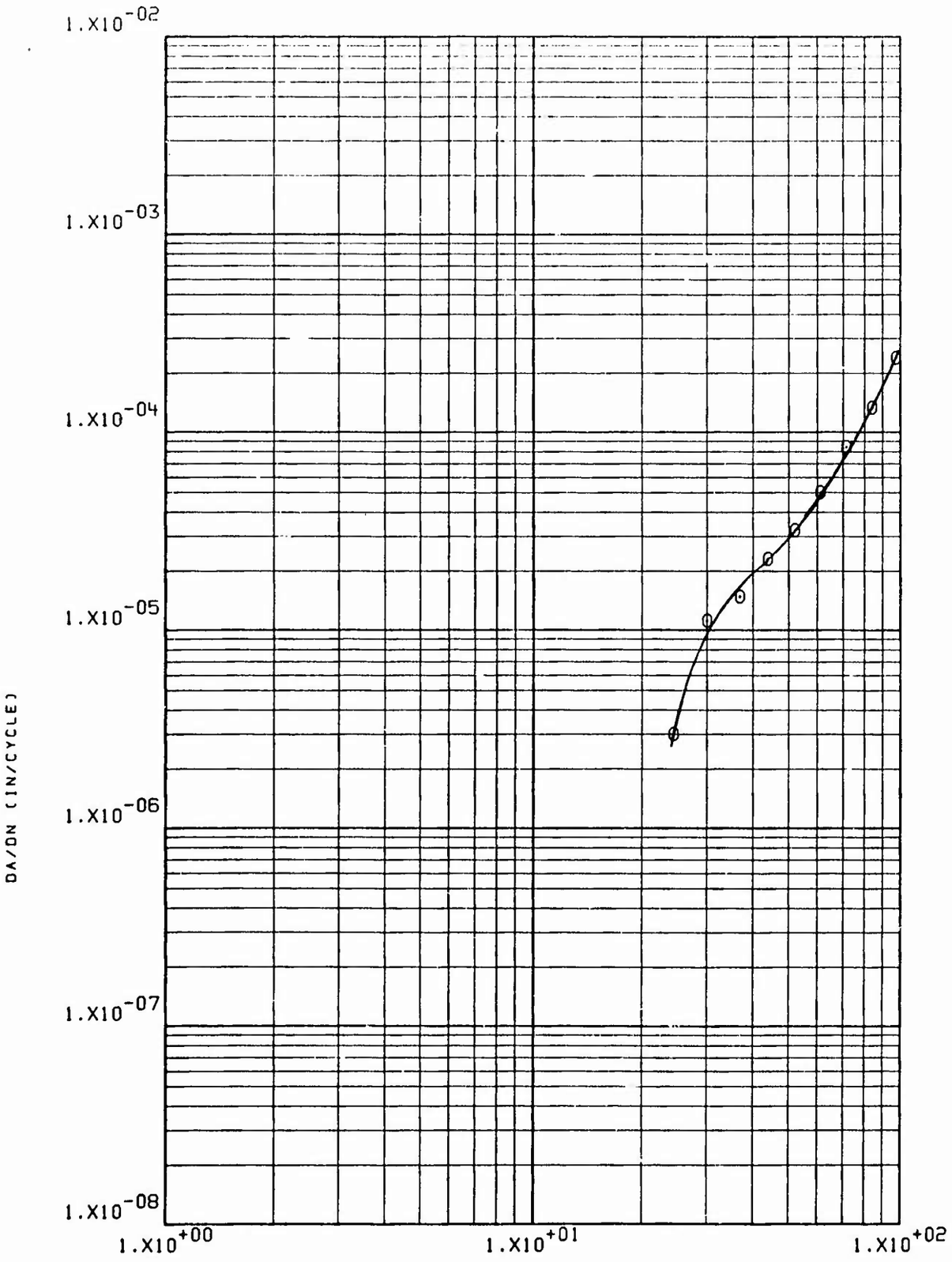
33 NRW 15-26 HP 9-4-.20 HT 100□ HUMIDITY R.T. 60CPM R=.5



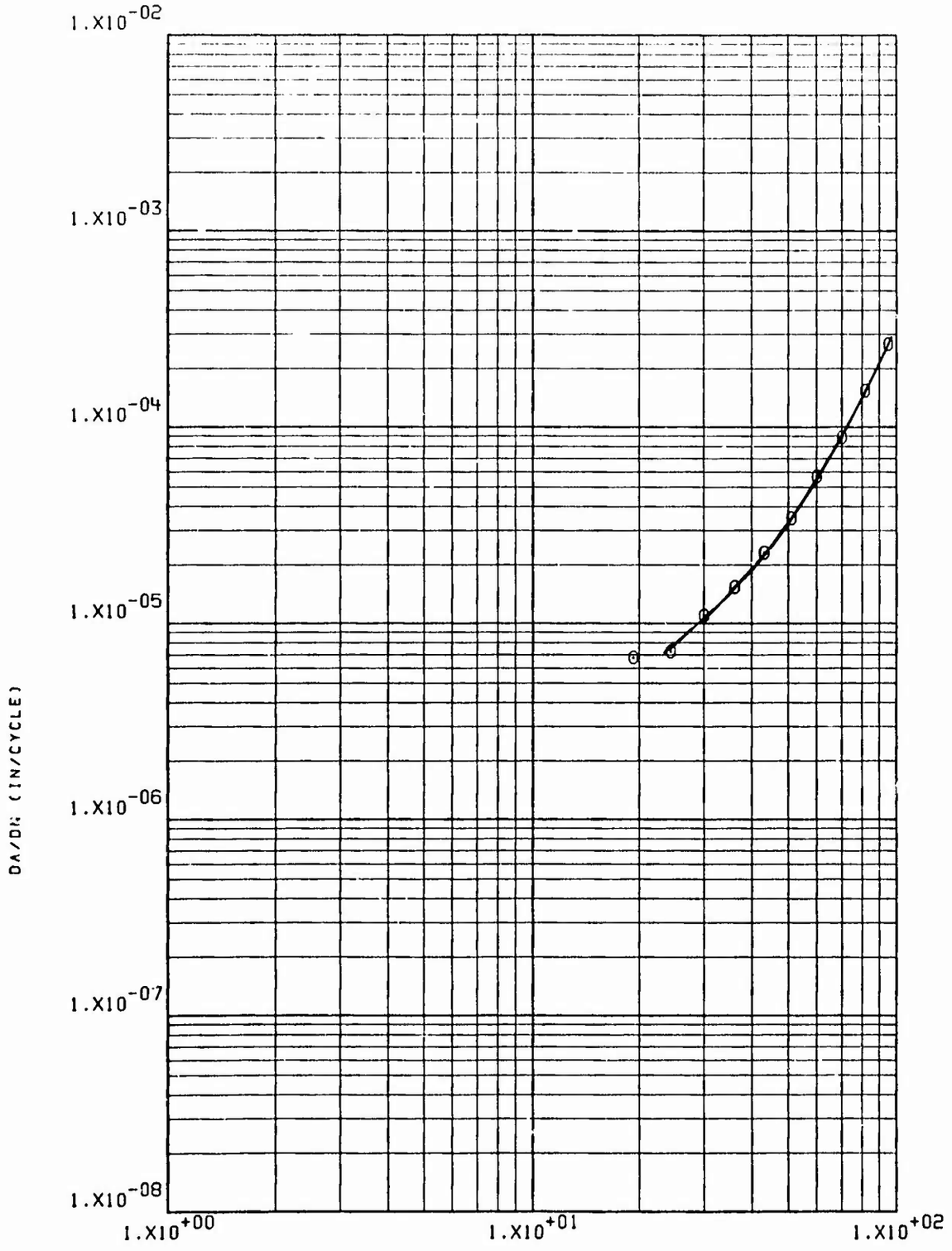
33 NRW 15-27 HP 9-4-.20 HT 100□ HUMIDITY R.T. 60CPM R=.3



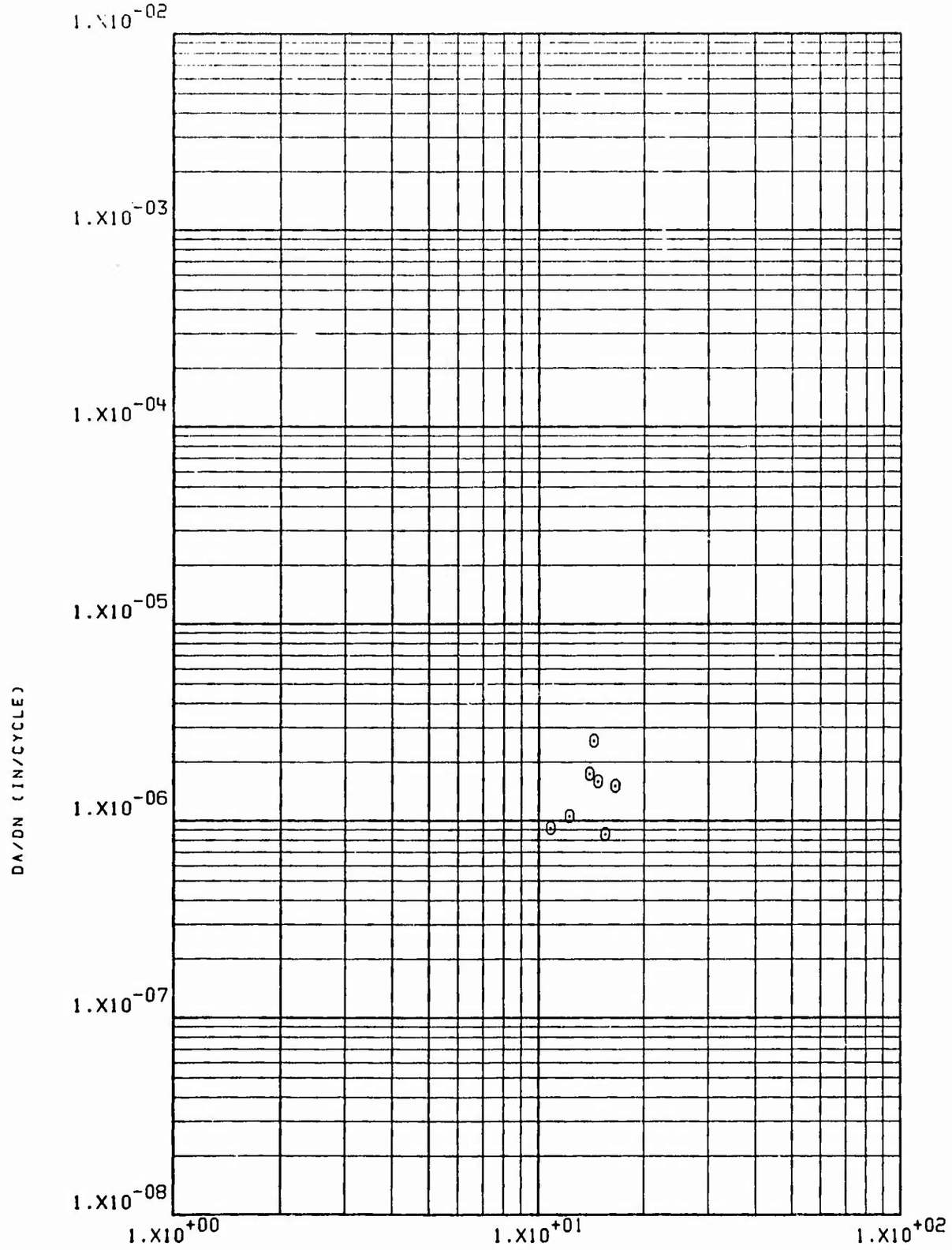
33 NRW 15-28 HP-9-4-.20 HT LHA R.T. 360CPM R=.08



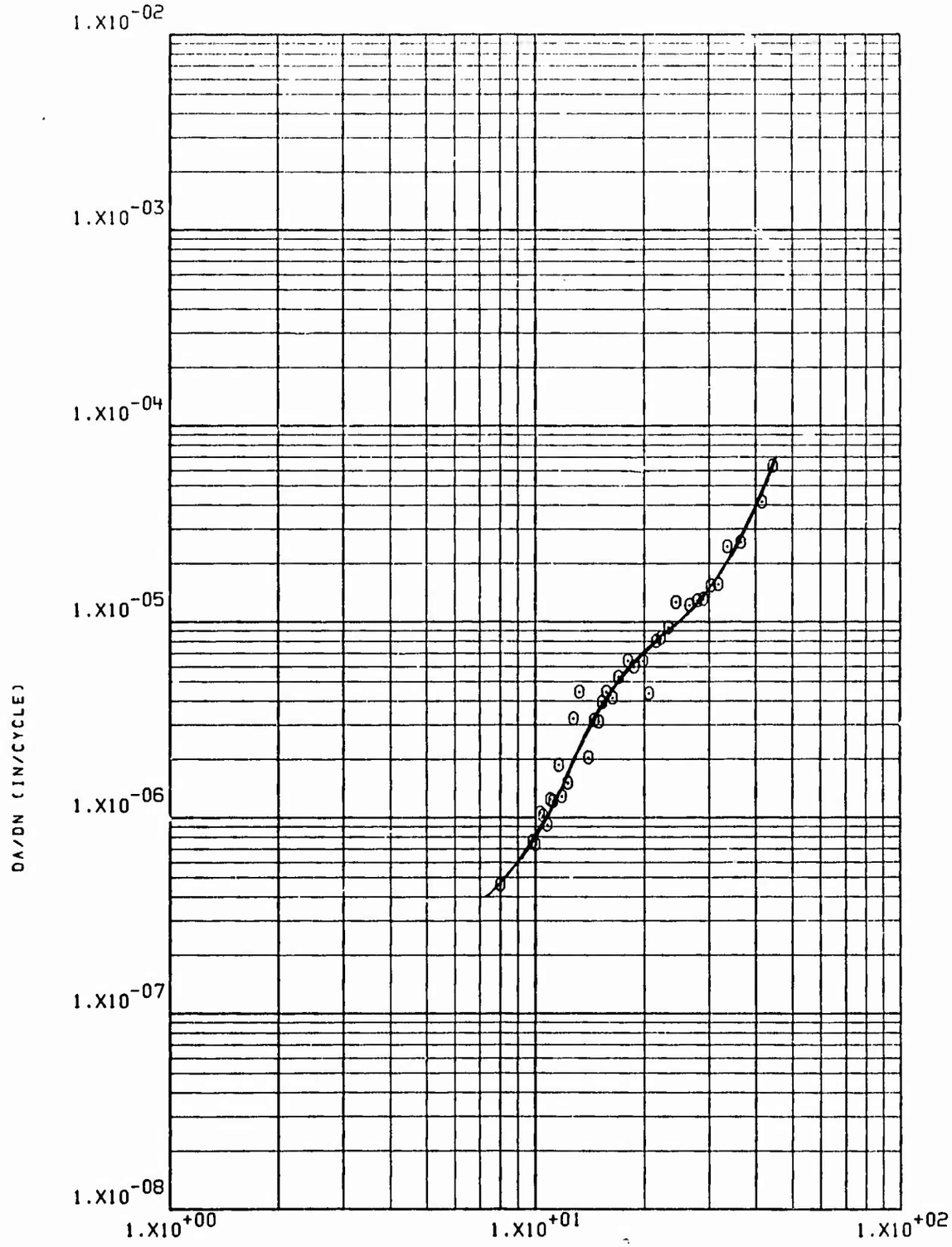
33 NWR 66 HP-9-4-.20 HT LHA RT R=.05 60 CPM



33 NRW 67 HP-9-4-.20 HT LHA RT R=.05 60 CPM



35 NRW 20-1 HP 9-4-30 HT SUMP RT R=.08 6CPM XXVIII-P-2-18



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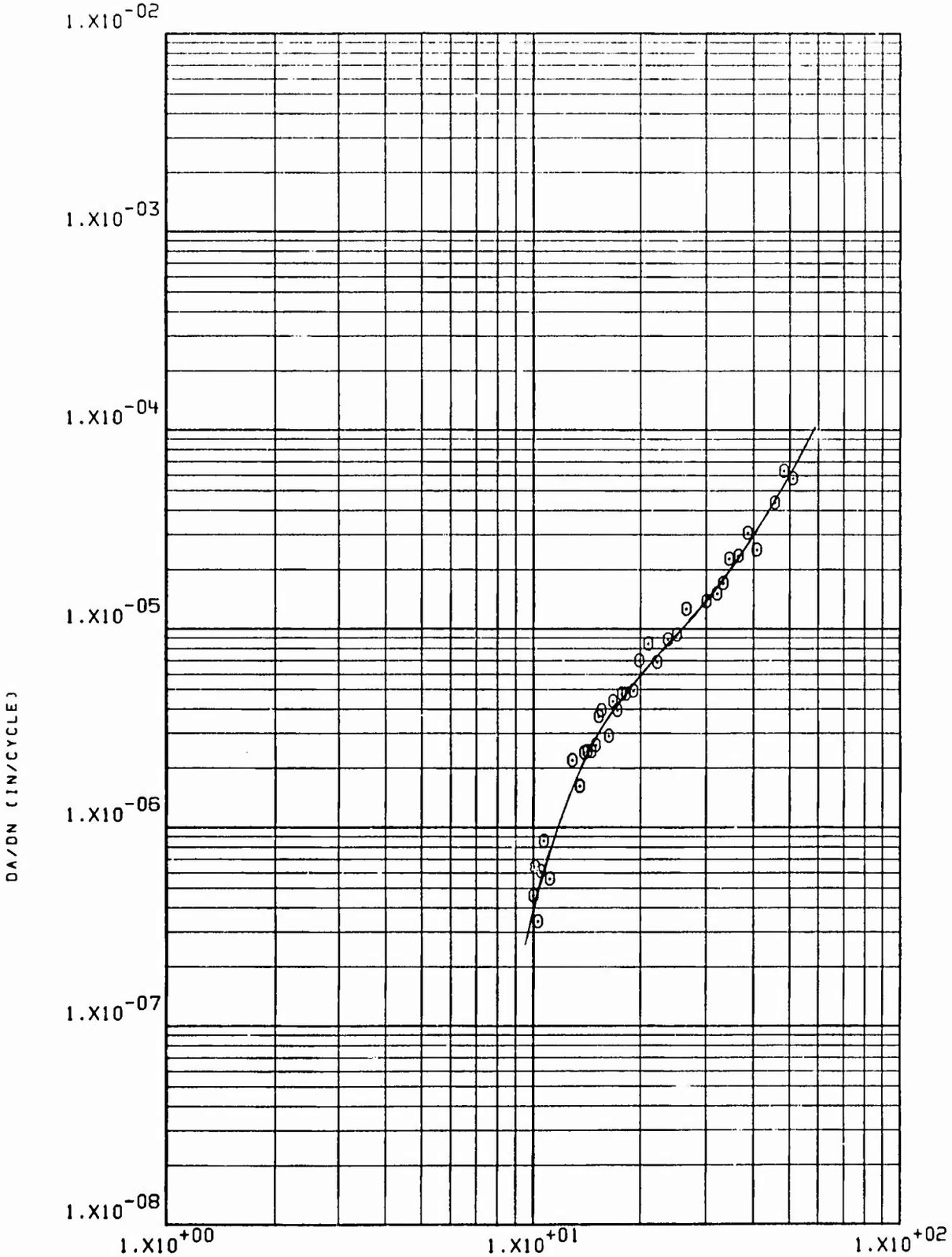
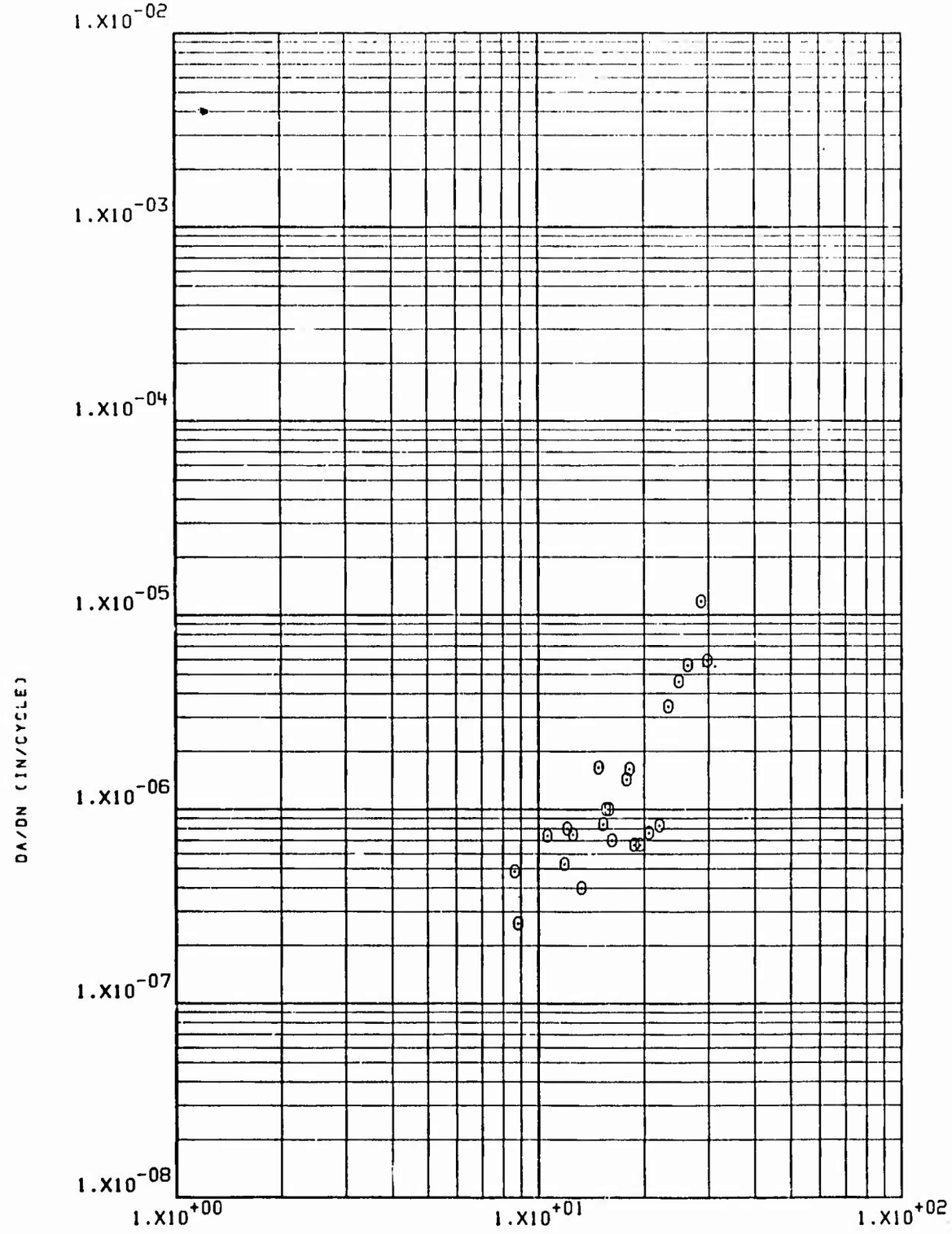
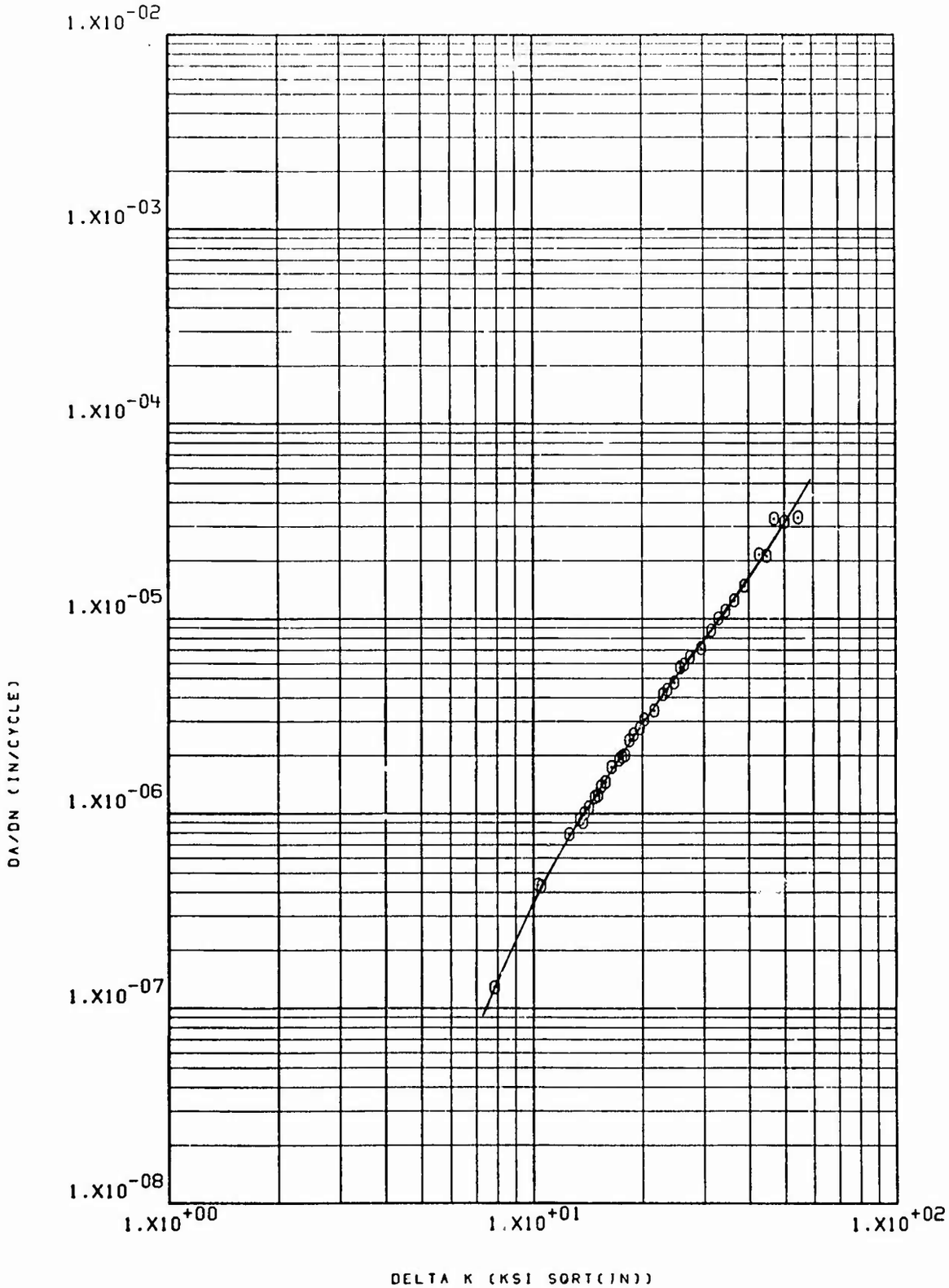


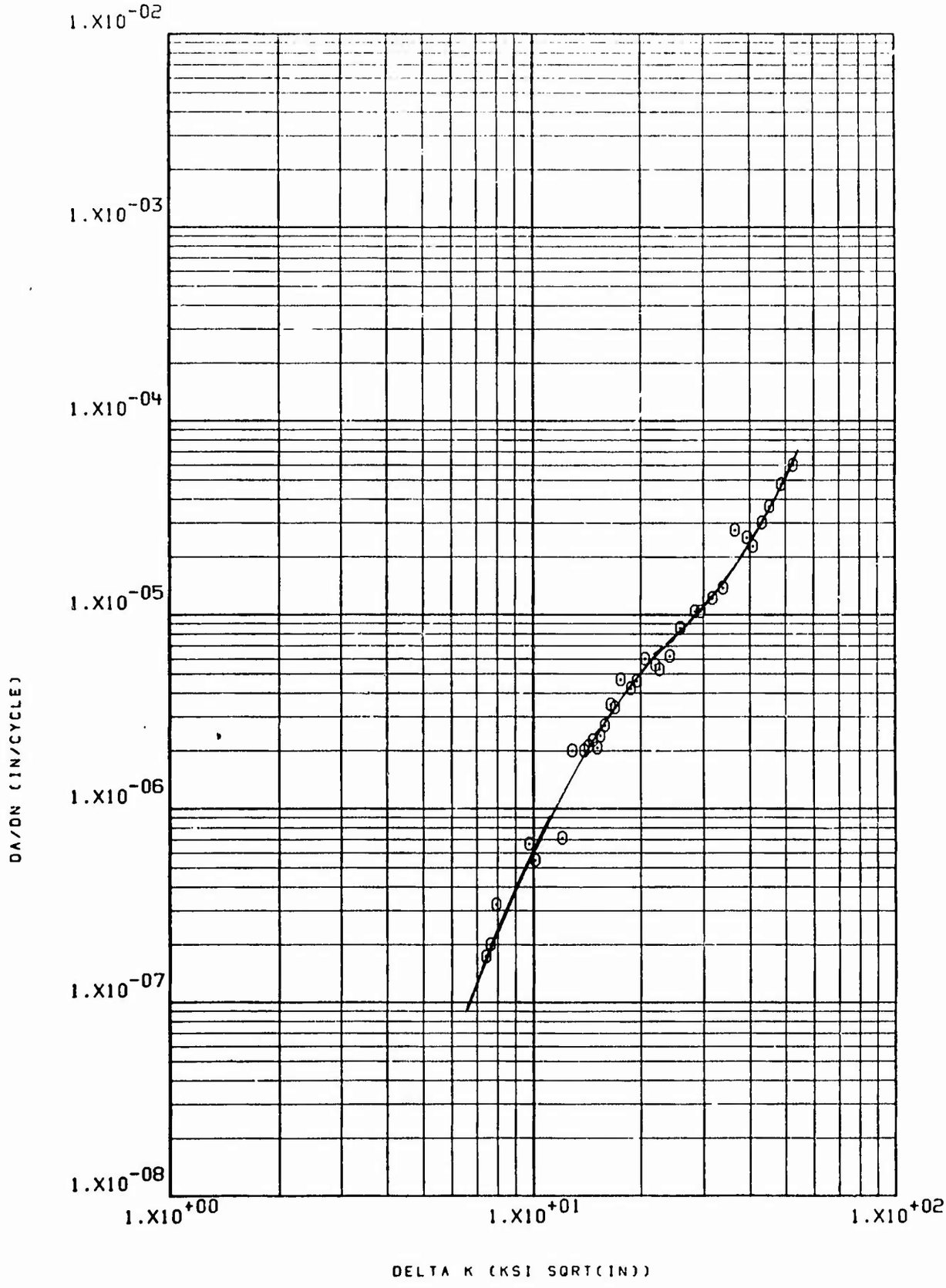
35 NRW 20-4 HT HP-9-4-30 SUMP 60 CPM RT R =.3 XXVIII-P-2-13



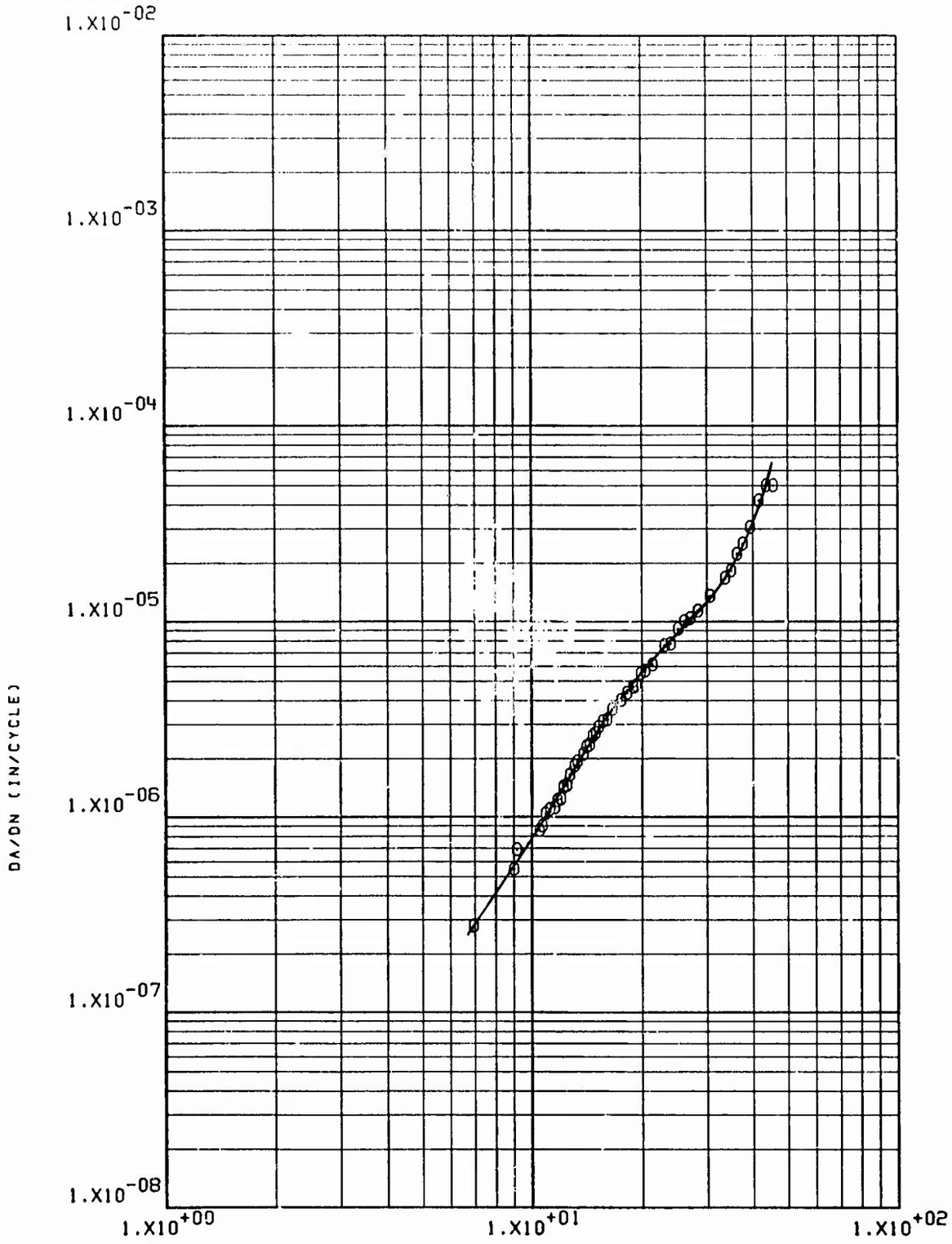
35 NRW 20-6 HP-9-4-.30 HT STW RT R=.08 60 CPM



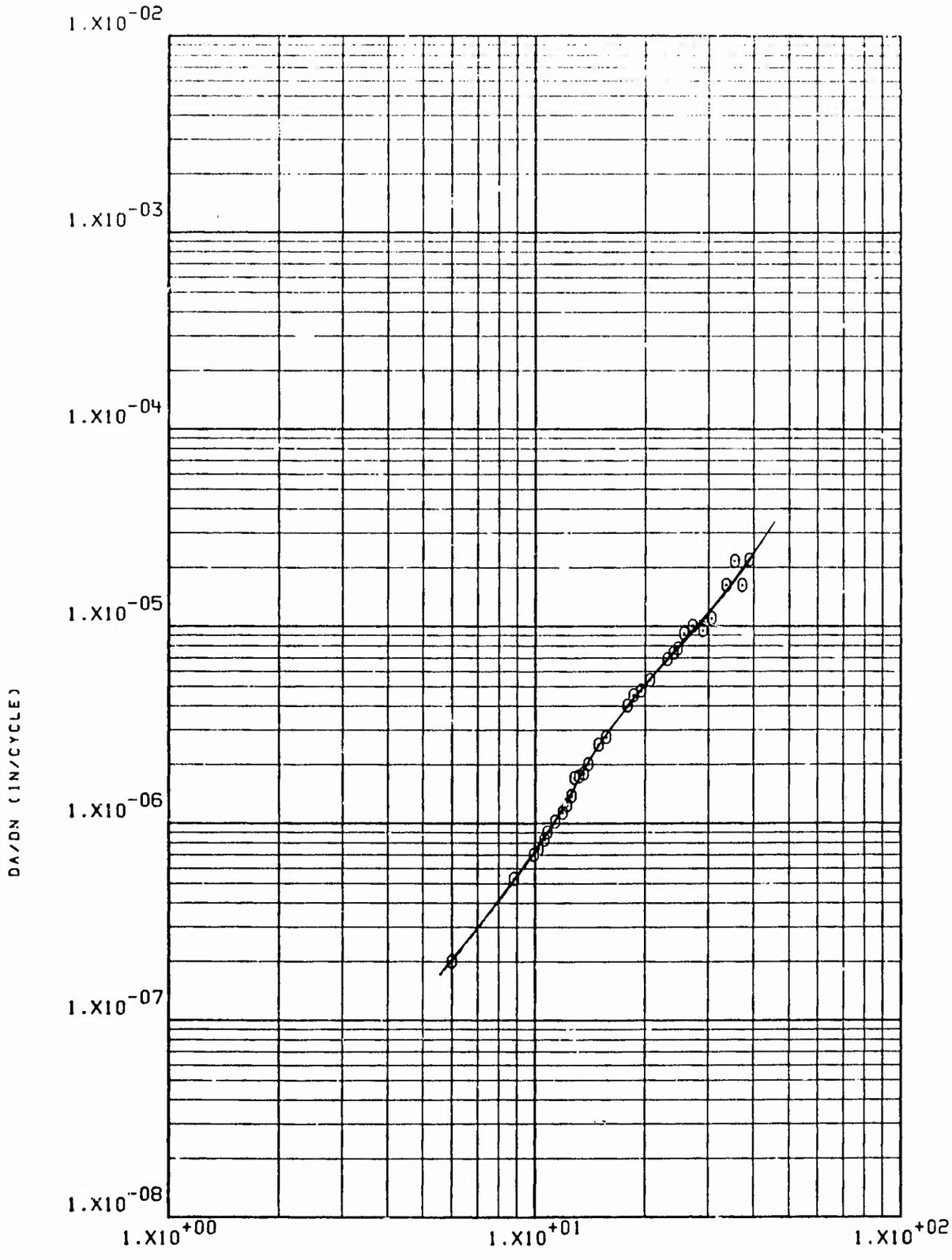
35 NRW 20-7 HP9-4-30 HT LHA TEMP -65 360CPM R=.08



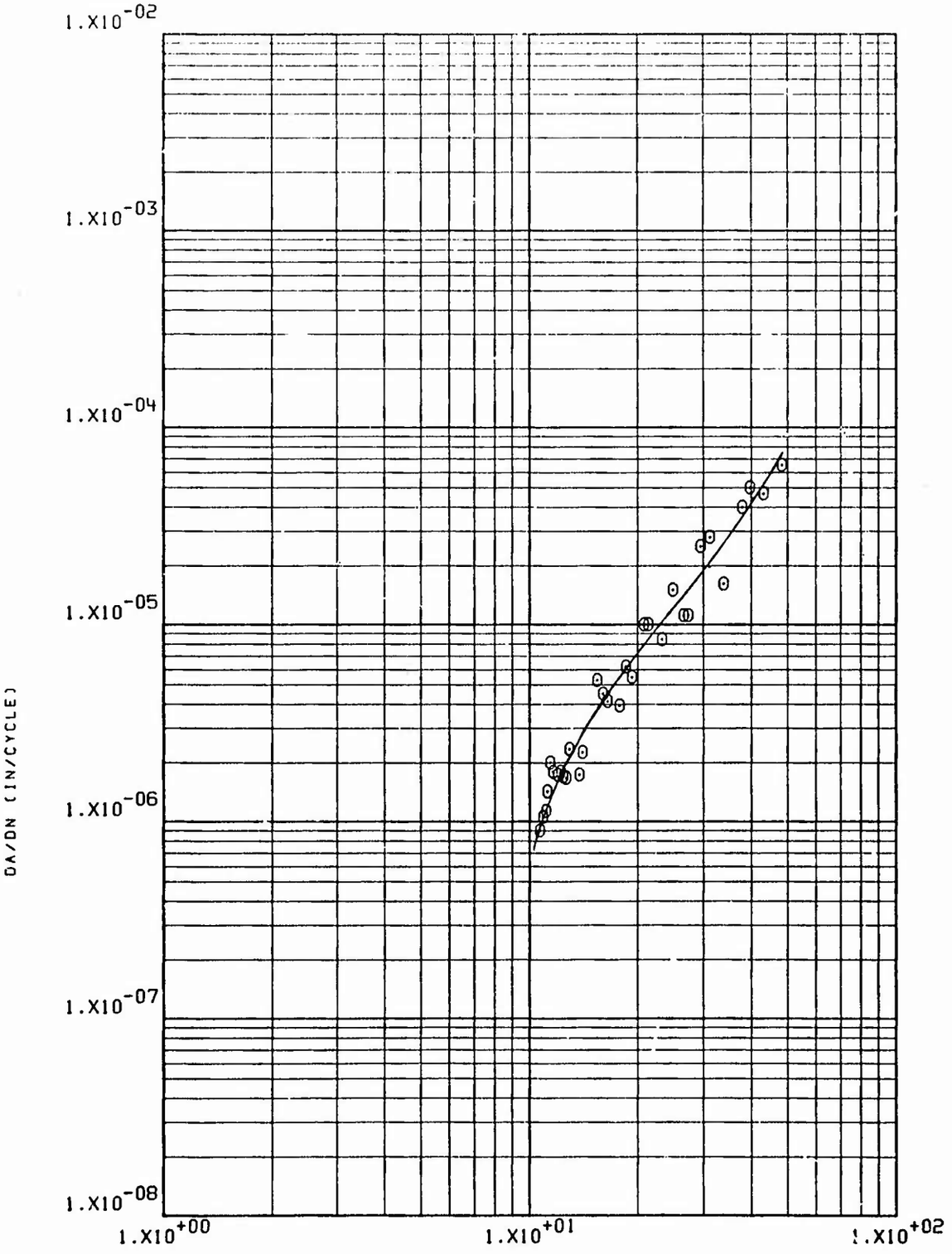
35 NWR 20-8 H P 9-4-30 HT SUMP RT R=0.08 60CPM



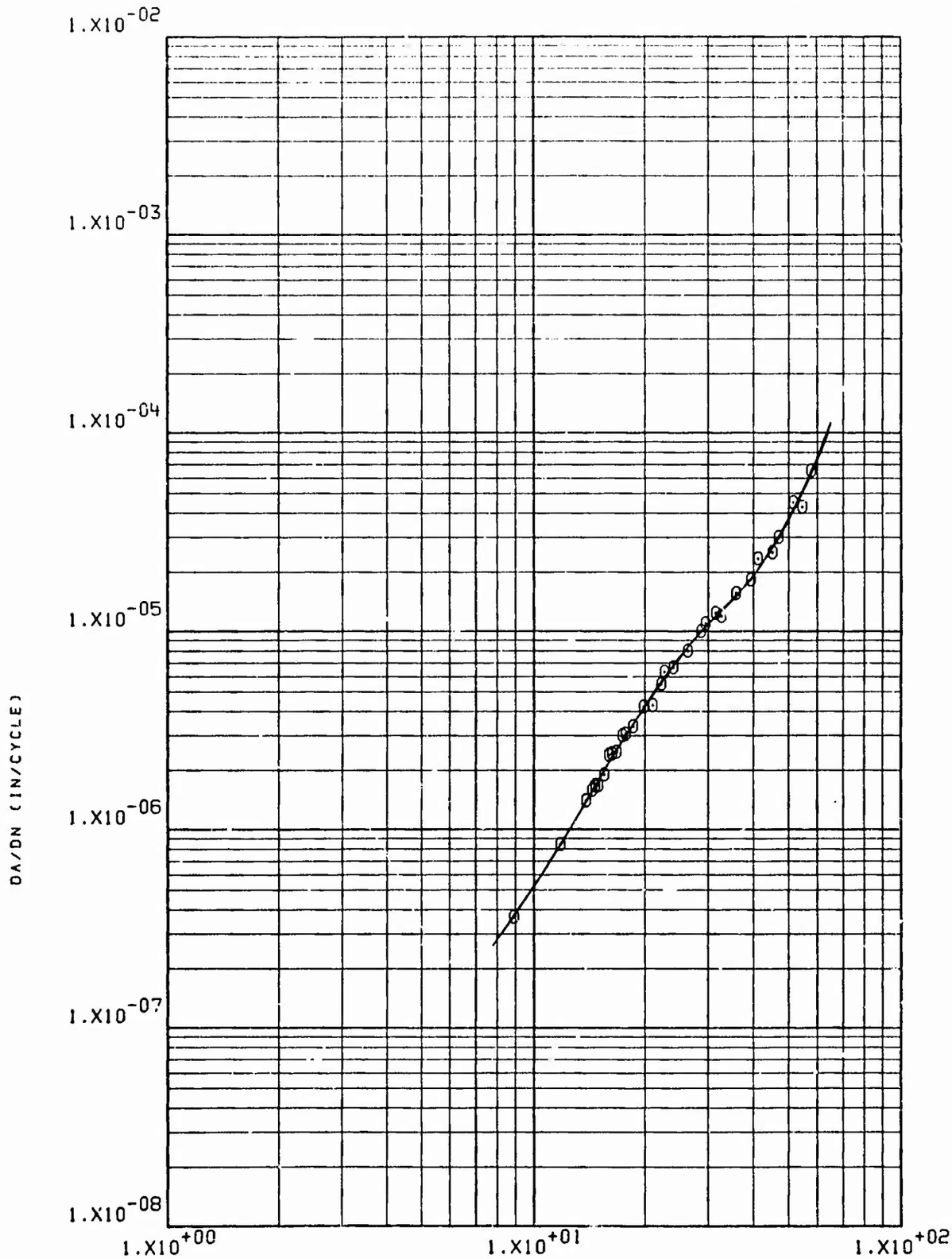
35 NRW 20-9 HP 9-4-30 HT LHA RT R=.5 360CPM



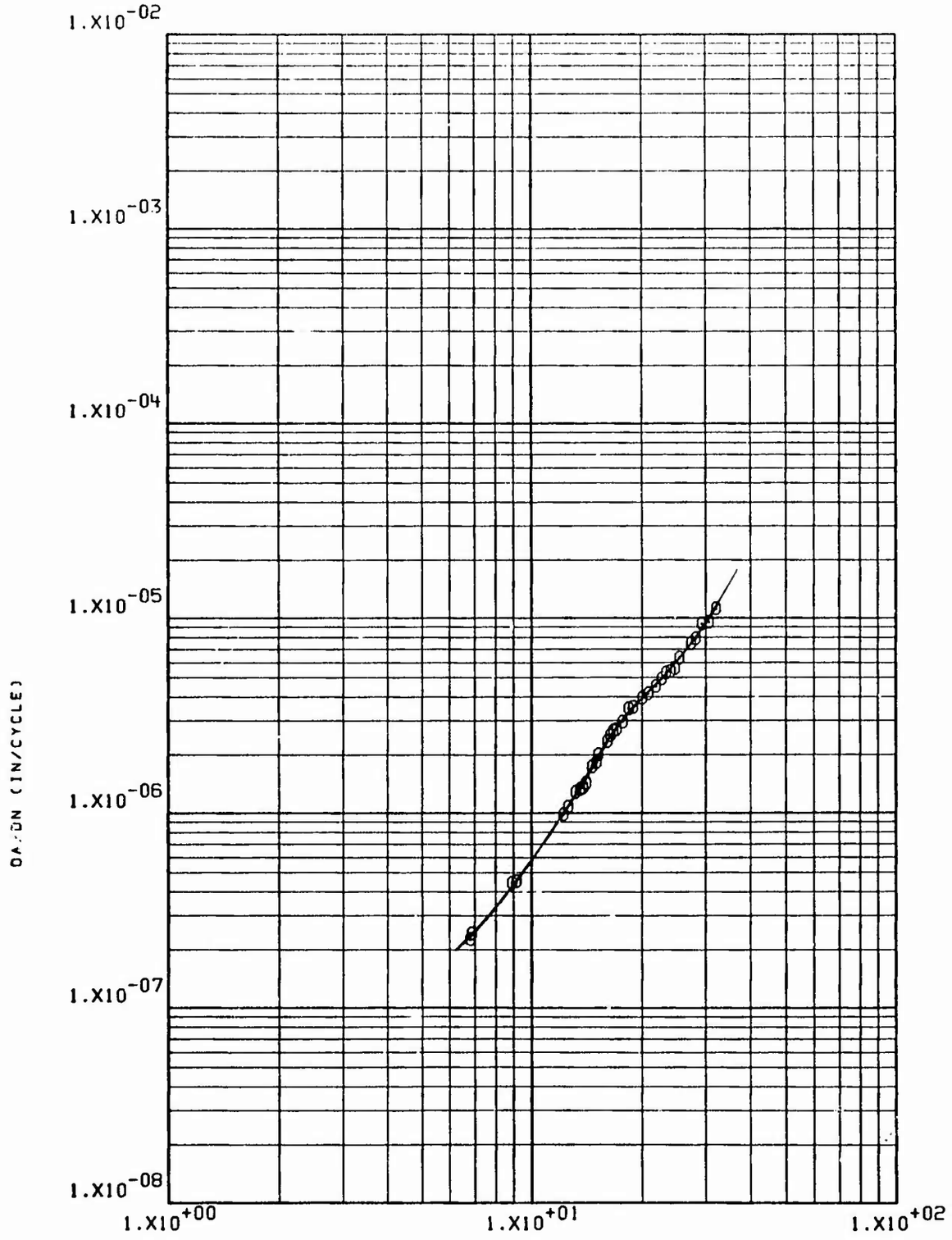
35 NRW 20-10 HP 9-4-.30 HT LHA R.T. 360CPM R=.3



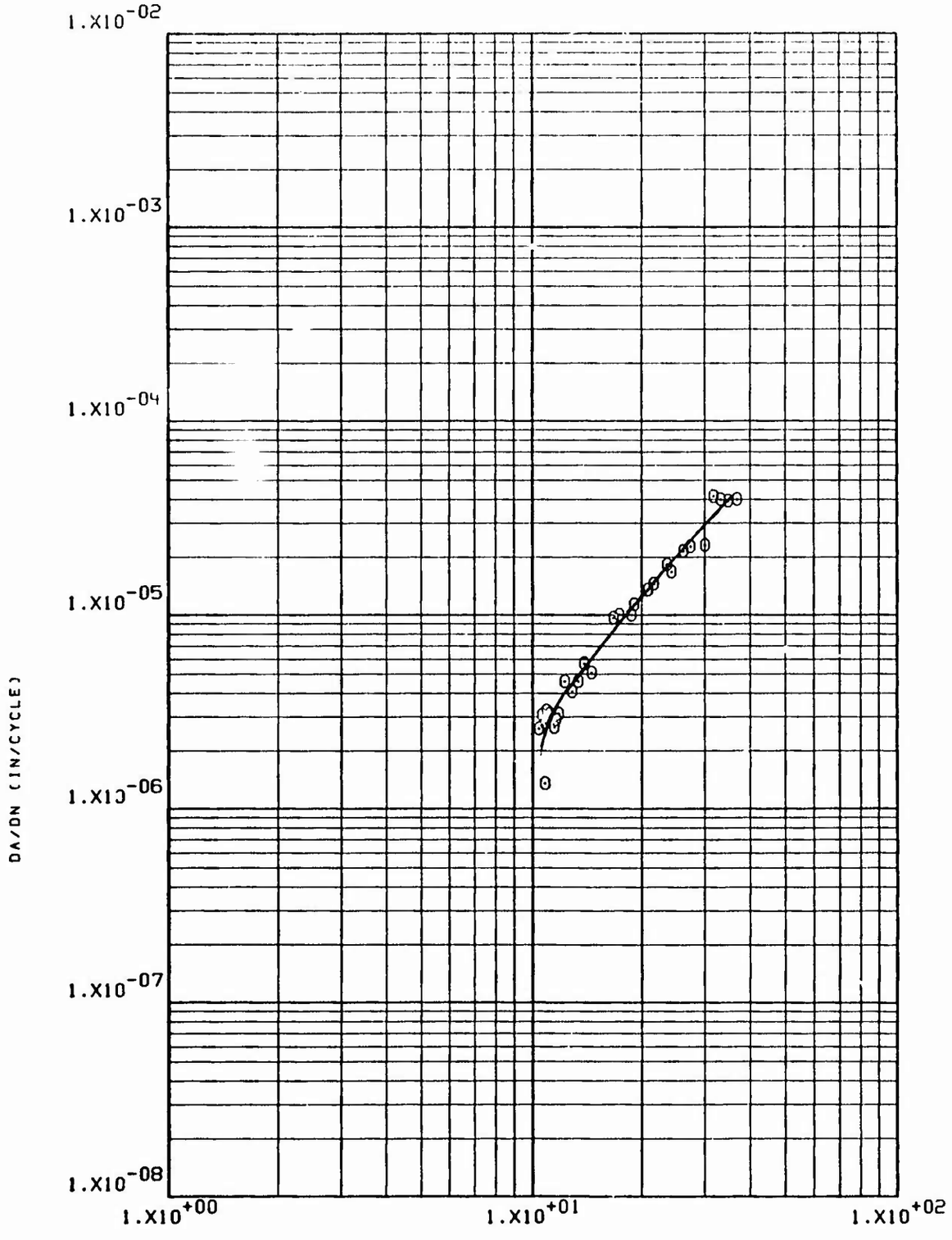
35 NRW 20-11 H P 9-4-30 HT SUMP RT R= 0.5 60CPM



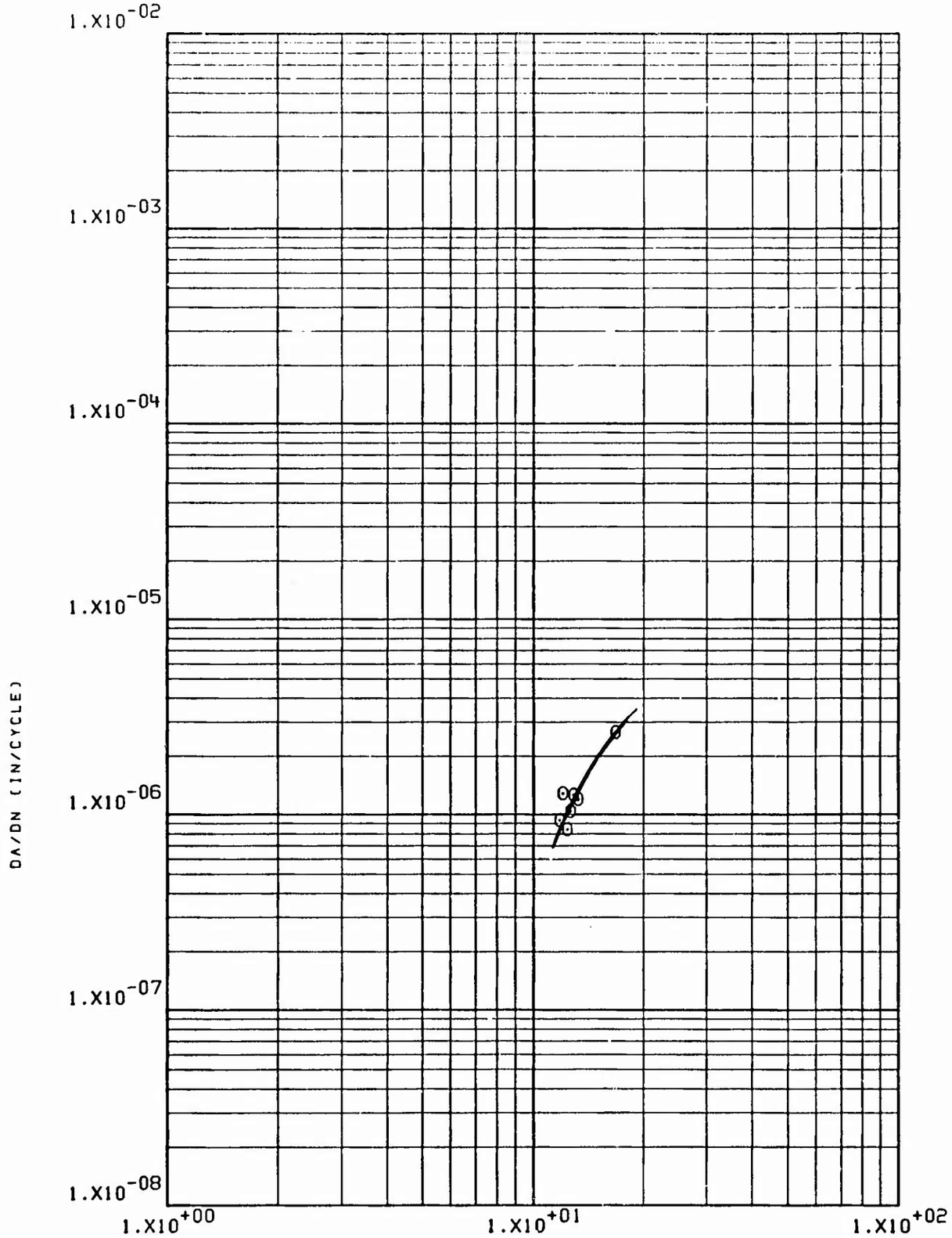
35 NRW 20-12 HP 9-4-.30 HT LHA R.T. 360CPM R=.08



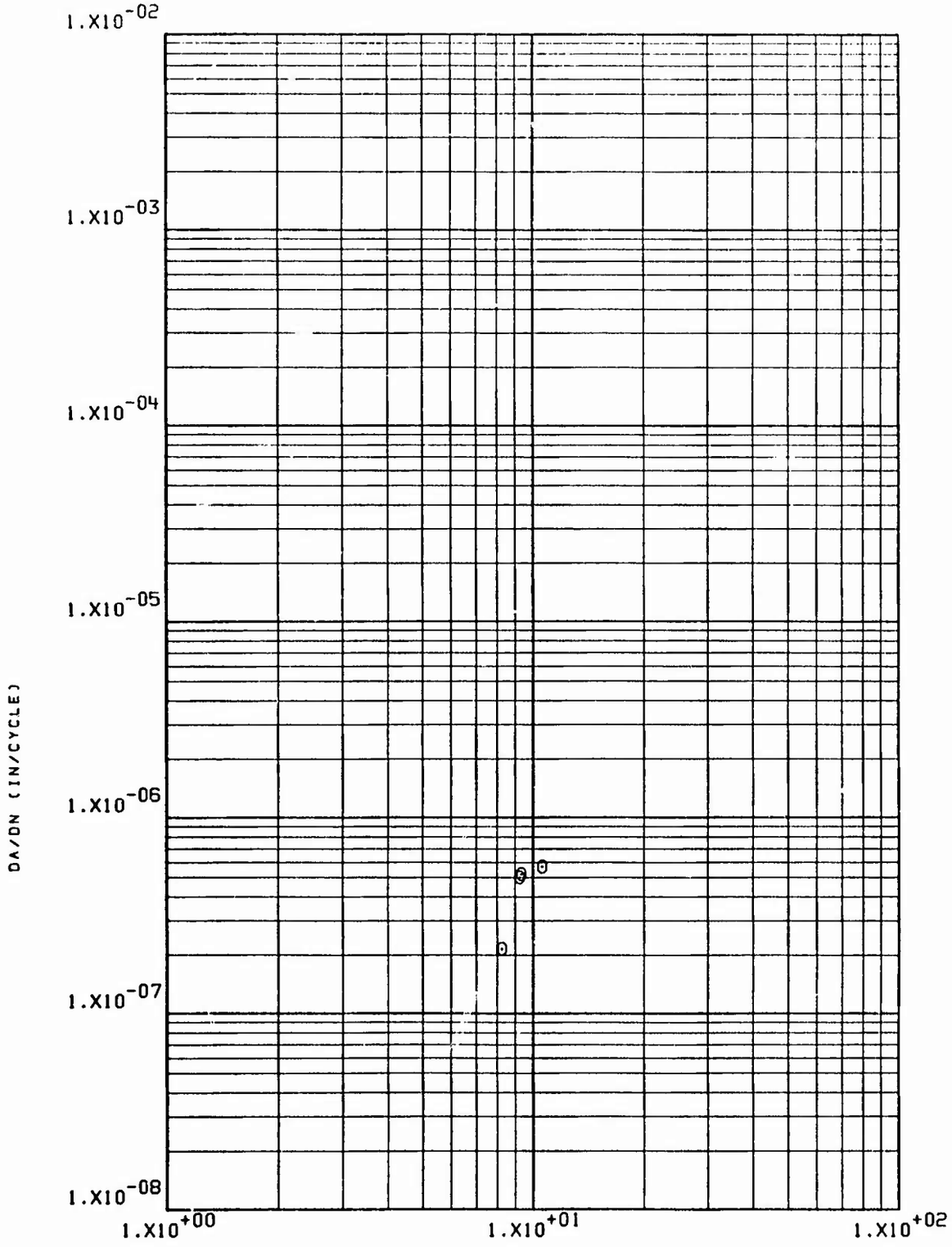
35 NRW 20-13 HP9-4-30 HT LHA RT 60CPM R=.08



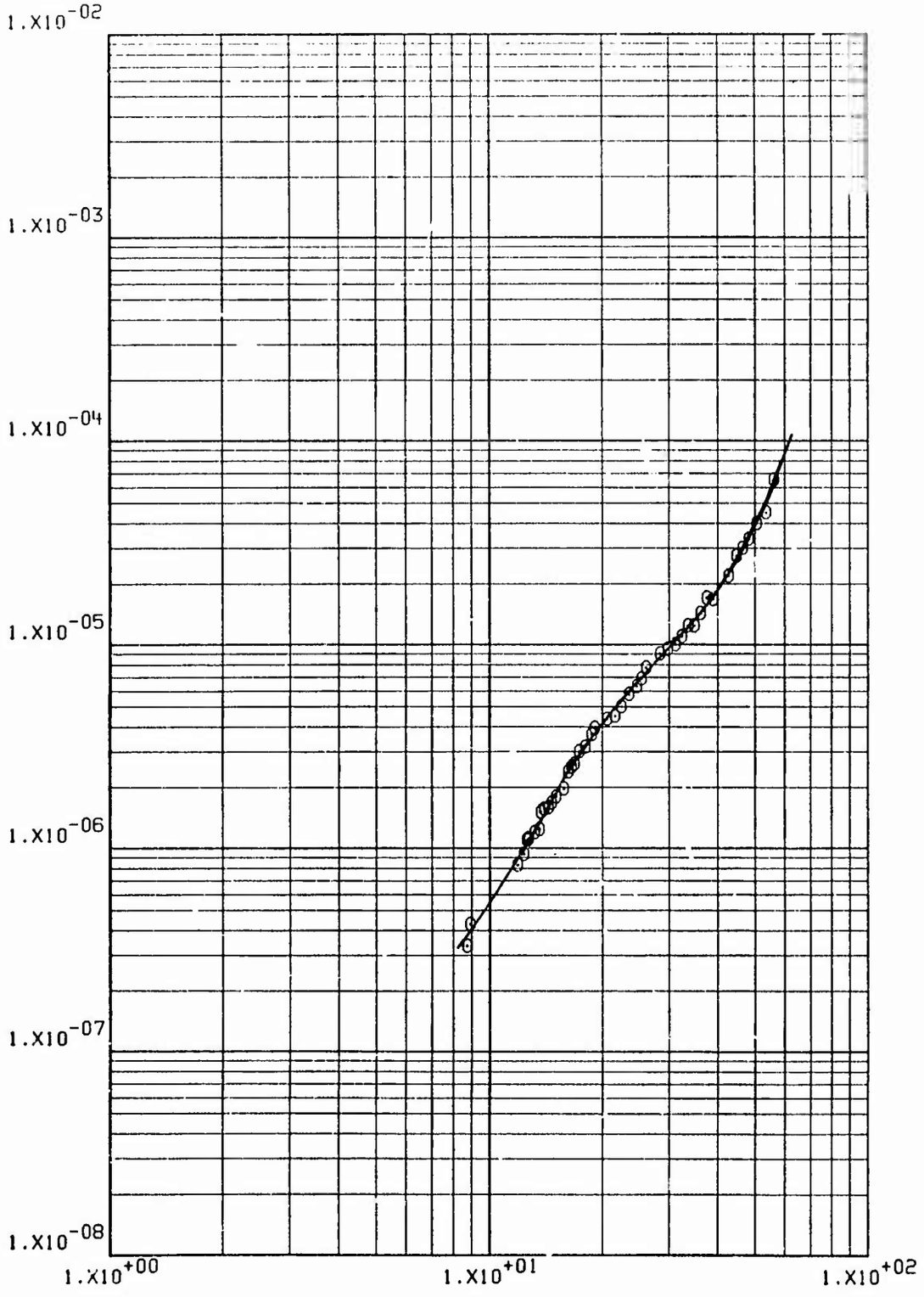
35 NRW 20-14 9-4-30 HT STW RT R=.08 6CPM



35 NRW 20-15 HP 9-4-30 HT LHA RT 6CPM R=.08



35 NWR 20-16 HP 9-4-30 HT SUMP RT R=.08 60CPM



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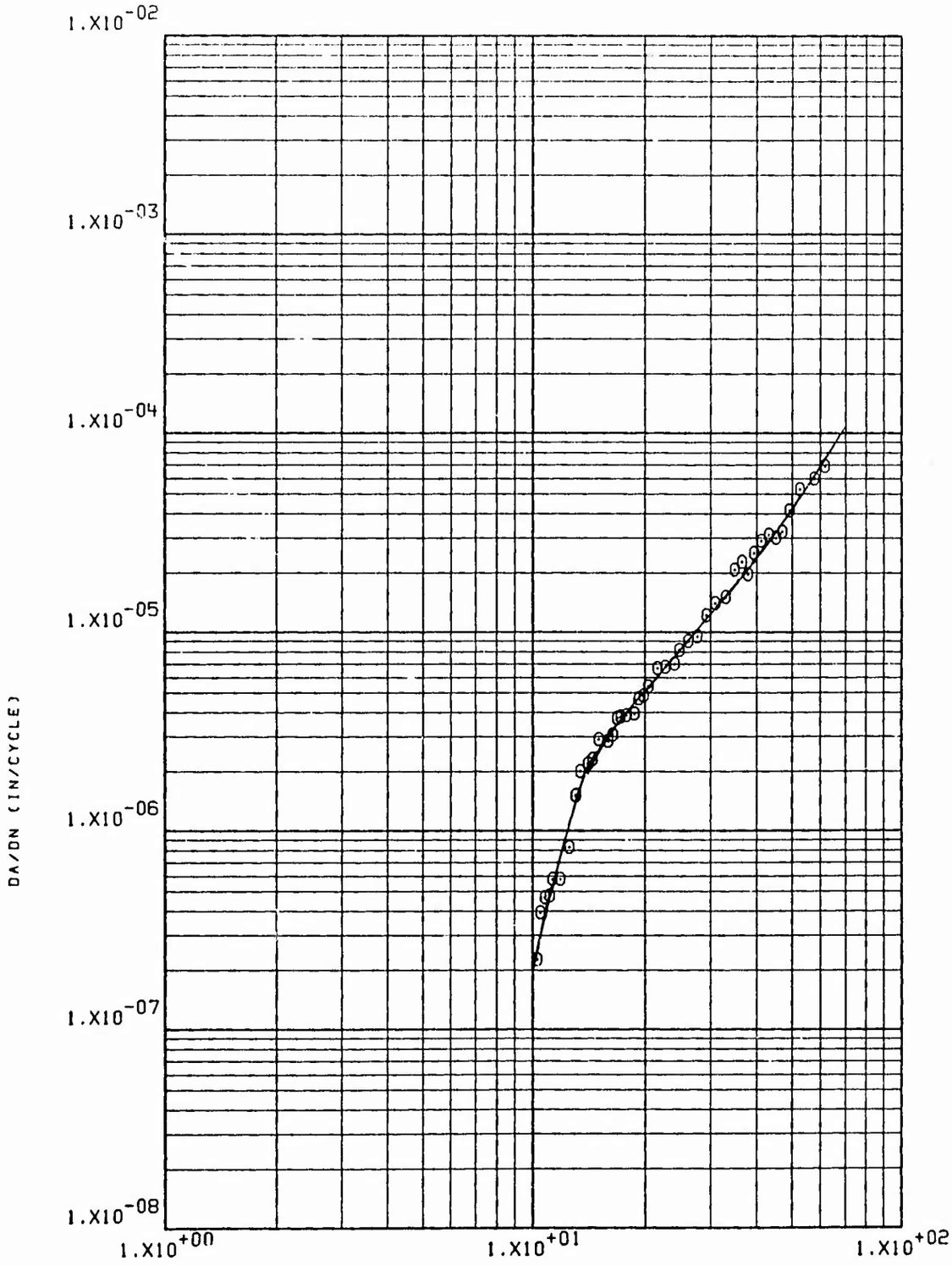
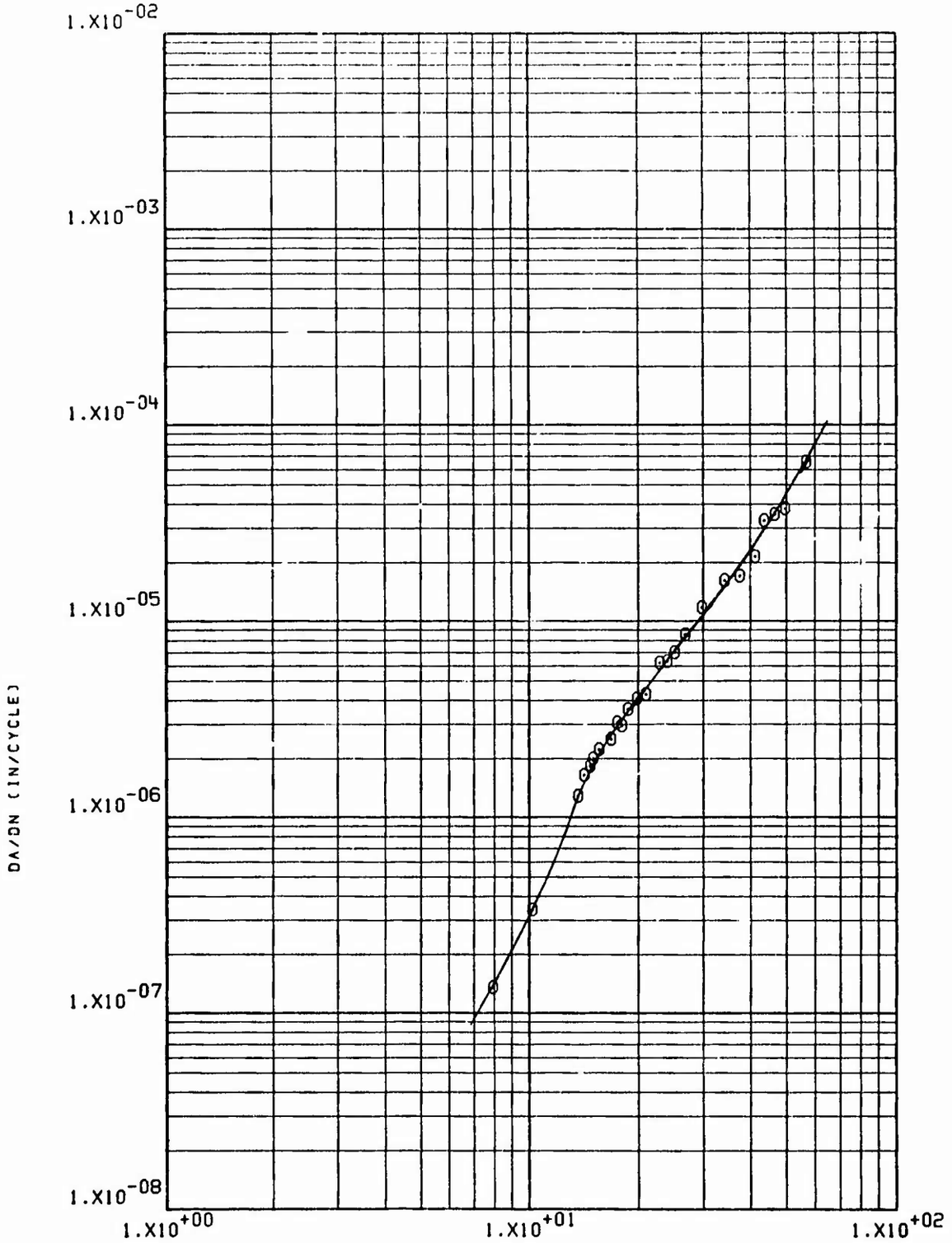
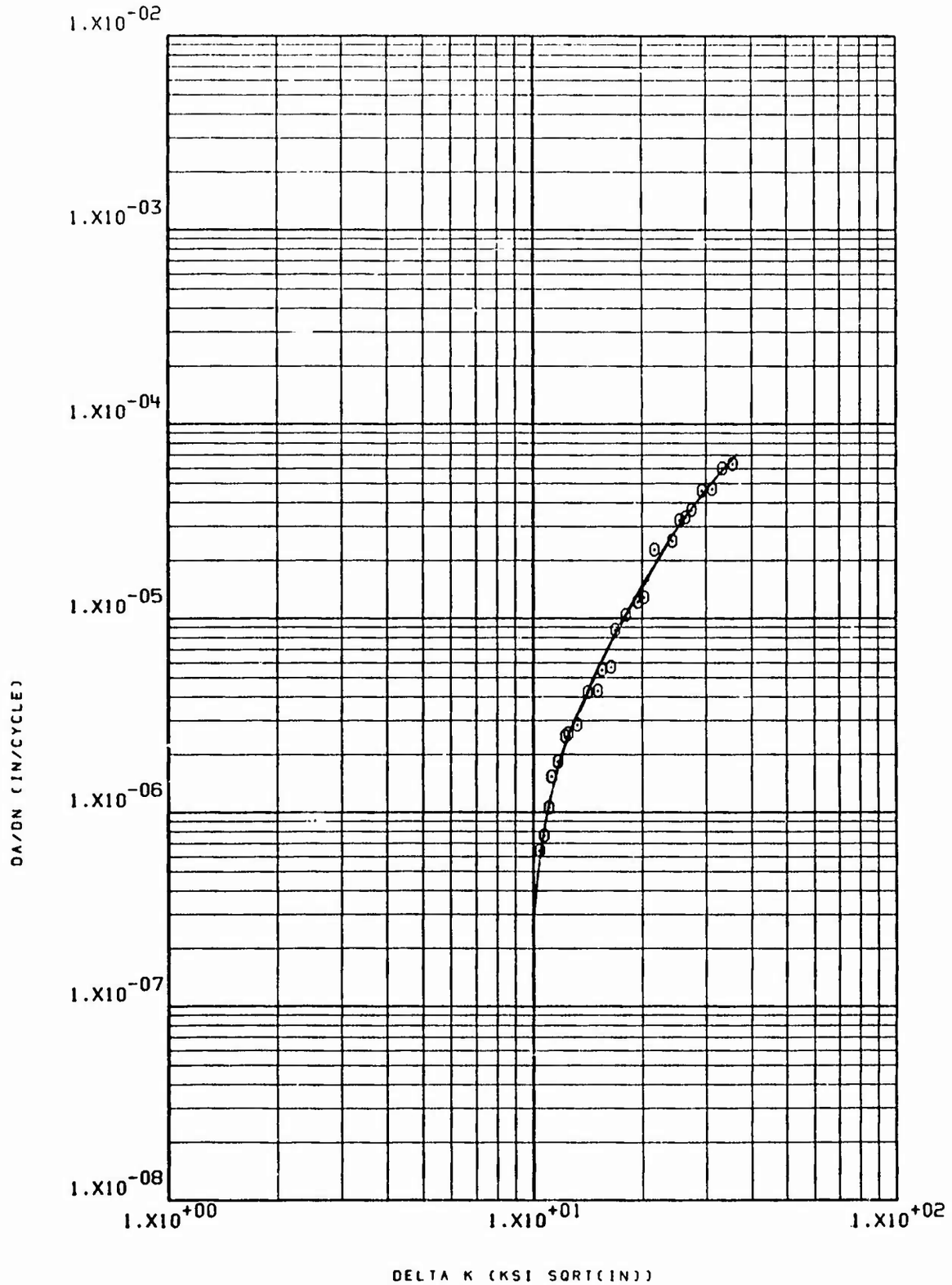


36 NRW 24-1 PH13-8 H1000 L.H.A. R.T. 360CPM R=.08



36 NRW 24-2 PH13-8 H1000 L.H.A. R.T. 360CPM R=.3



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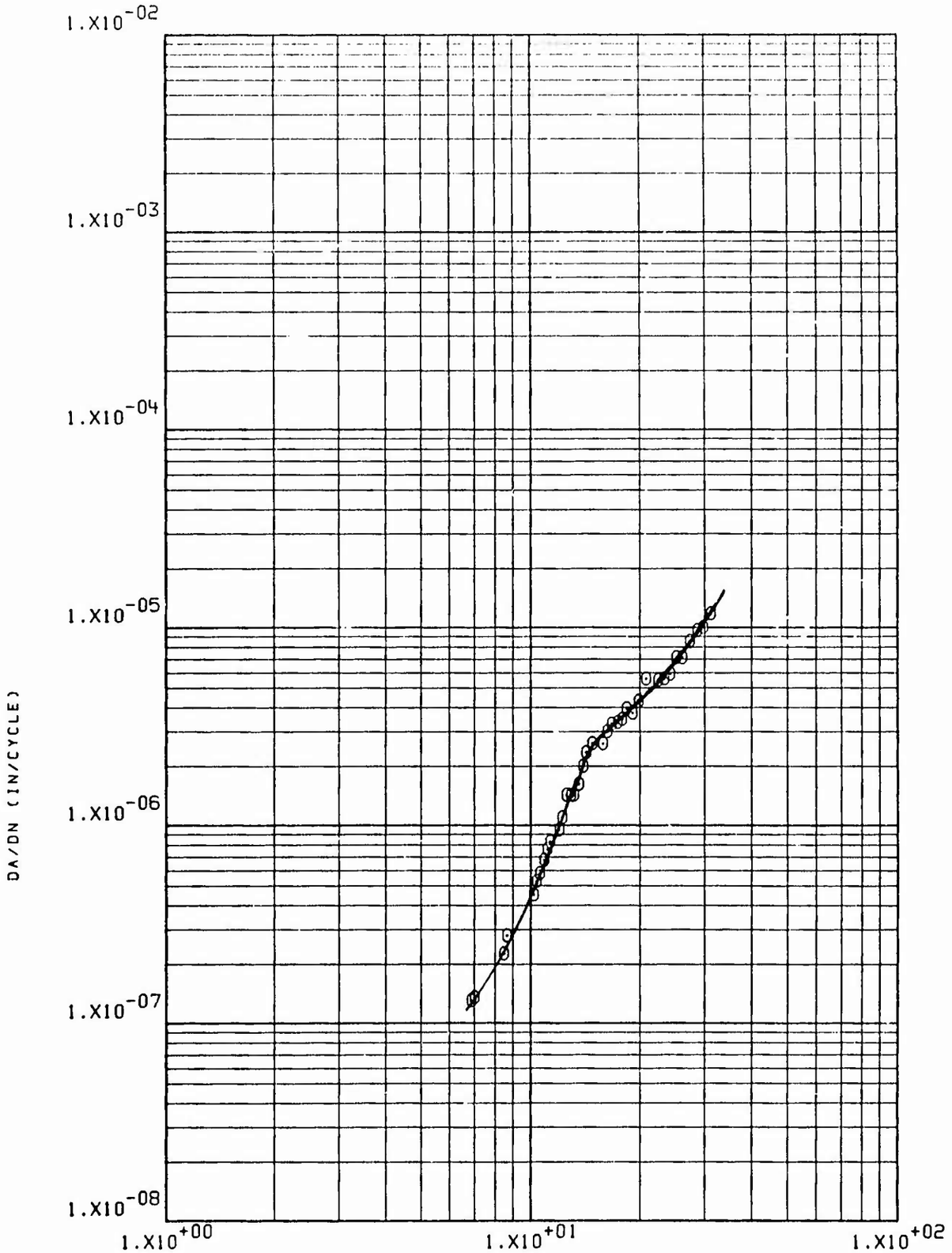

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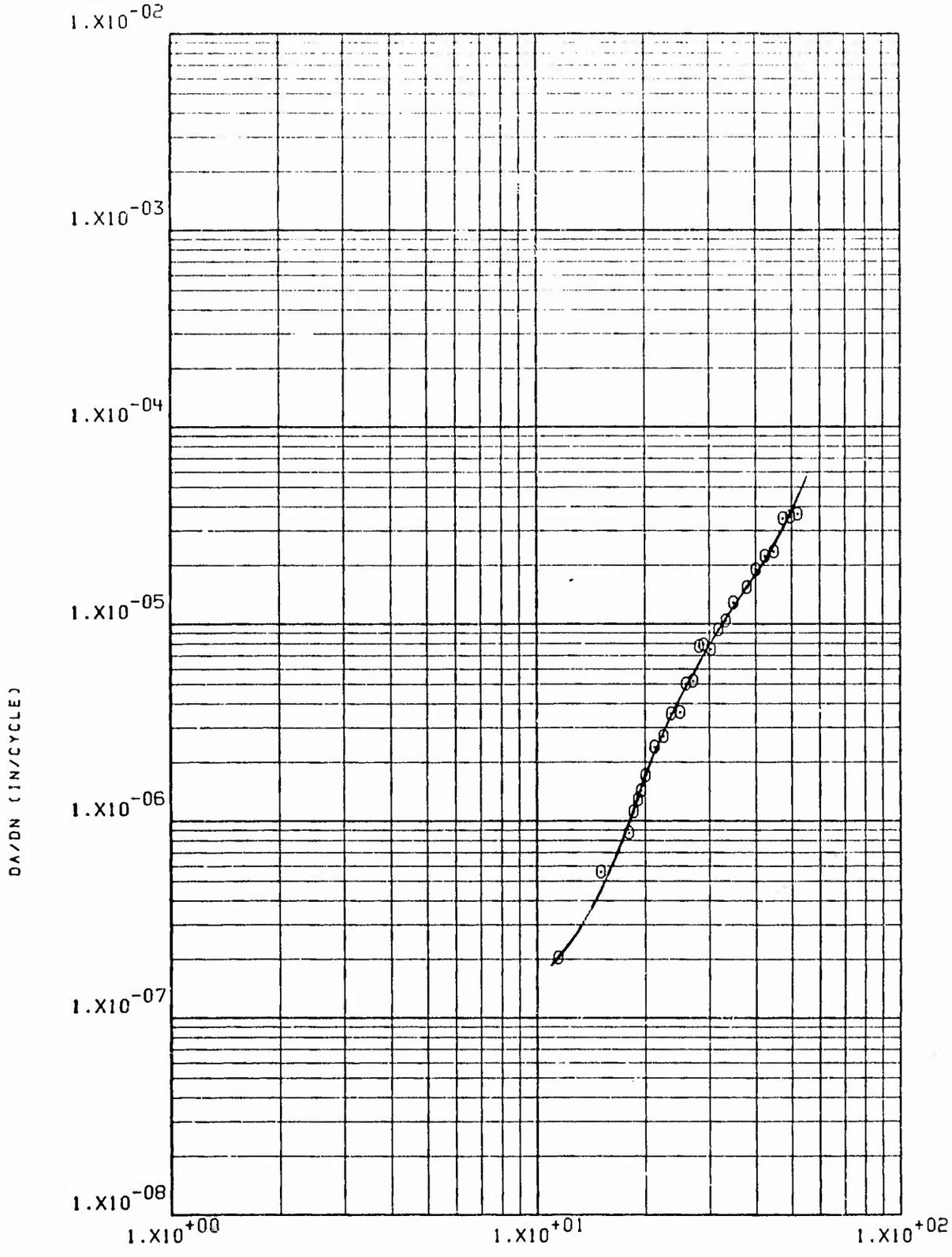

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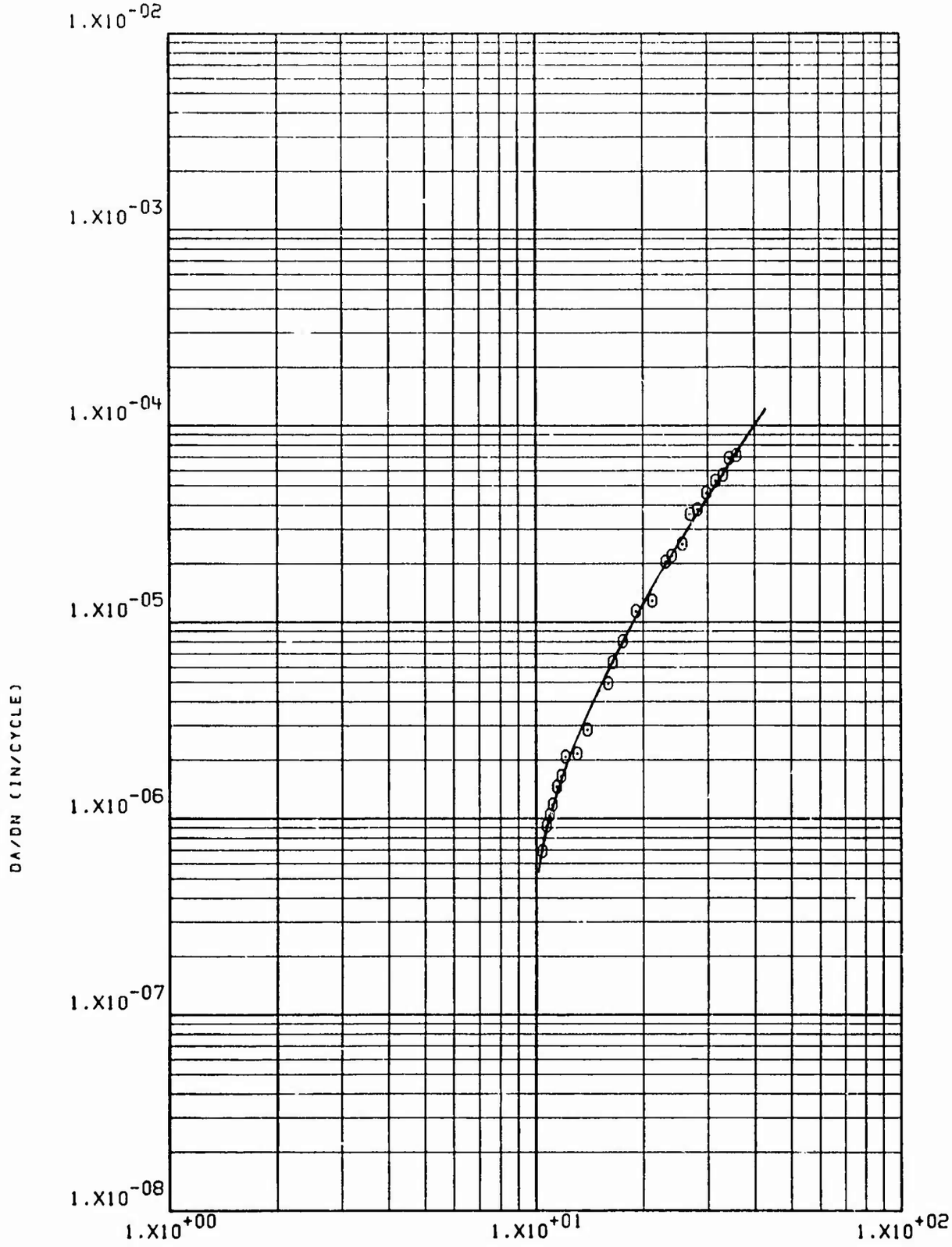

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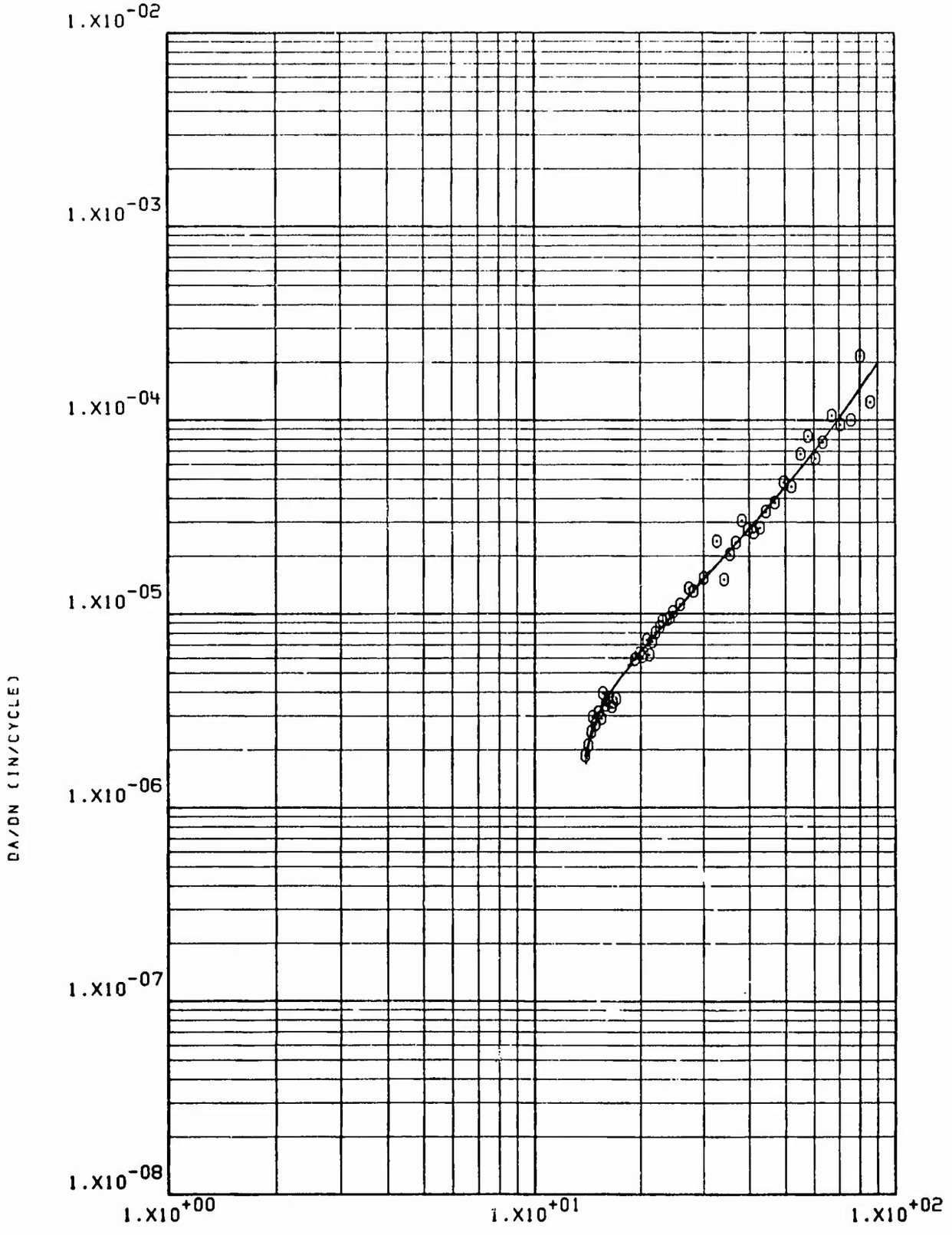
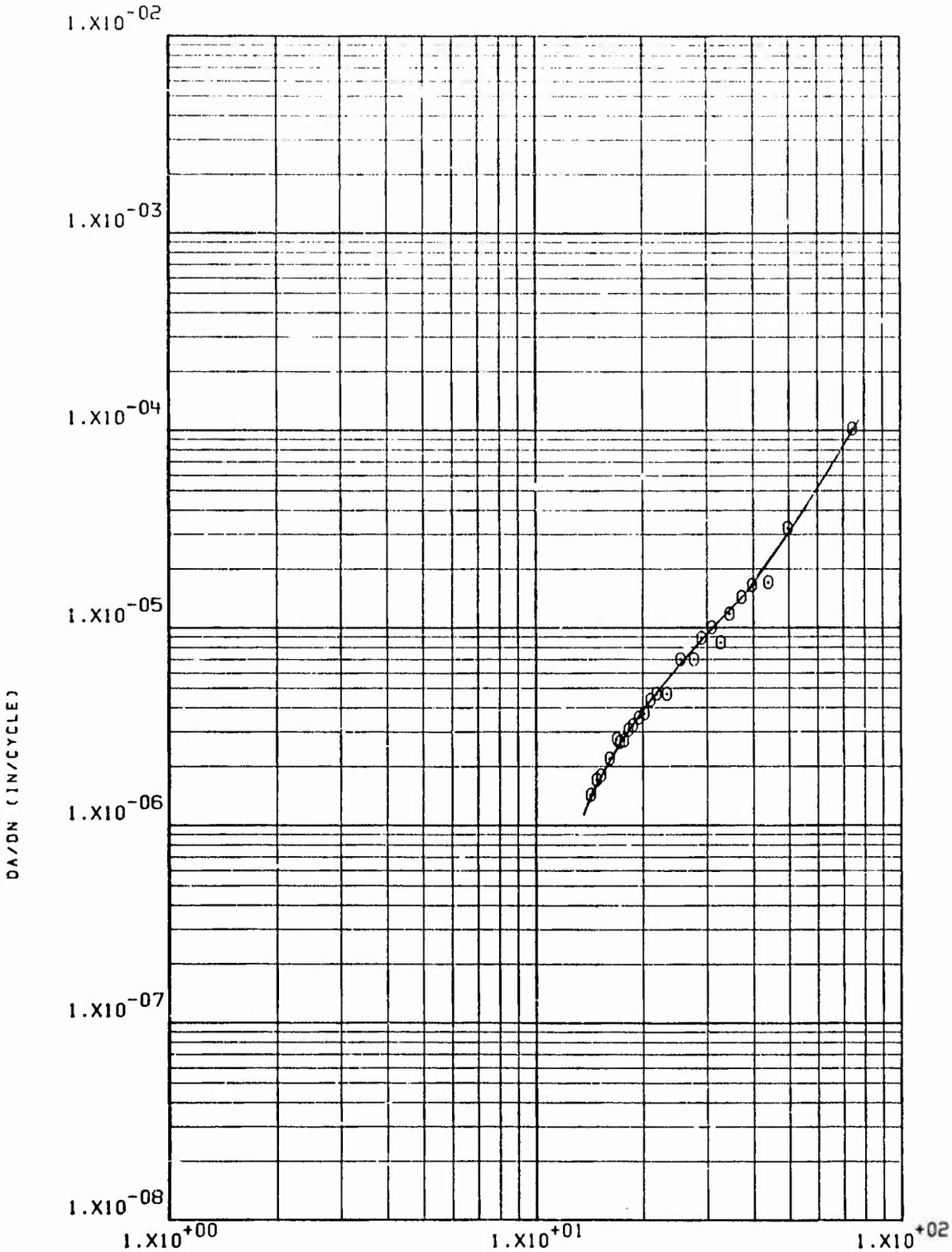
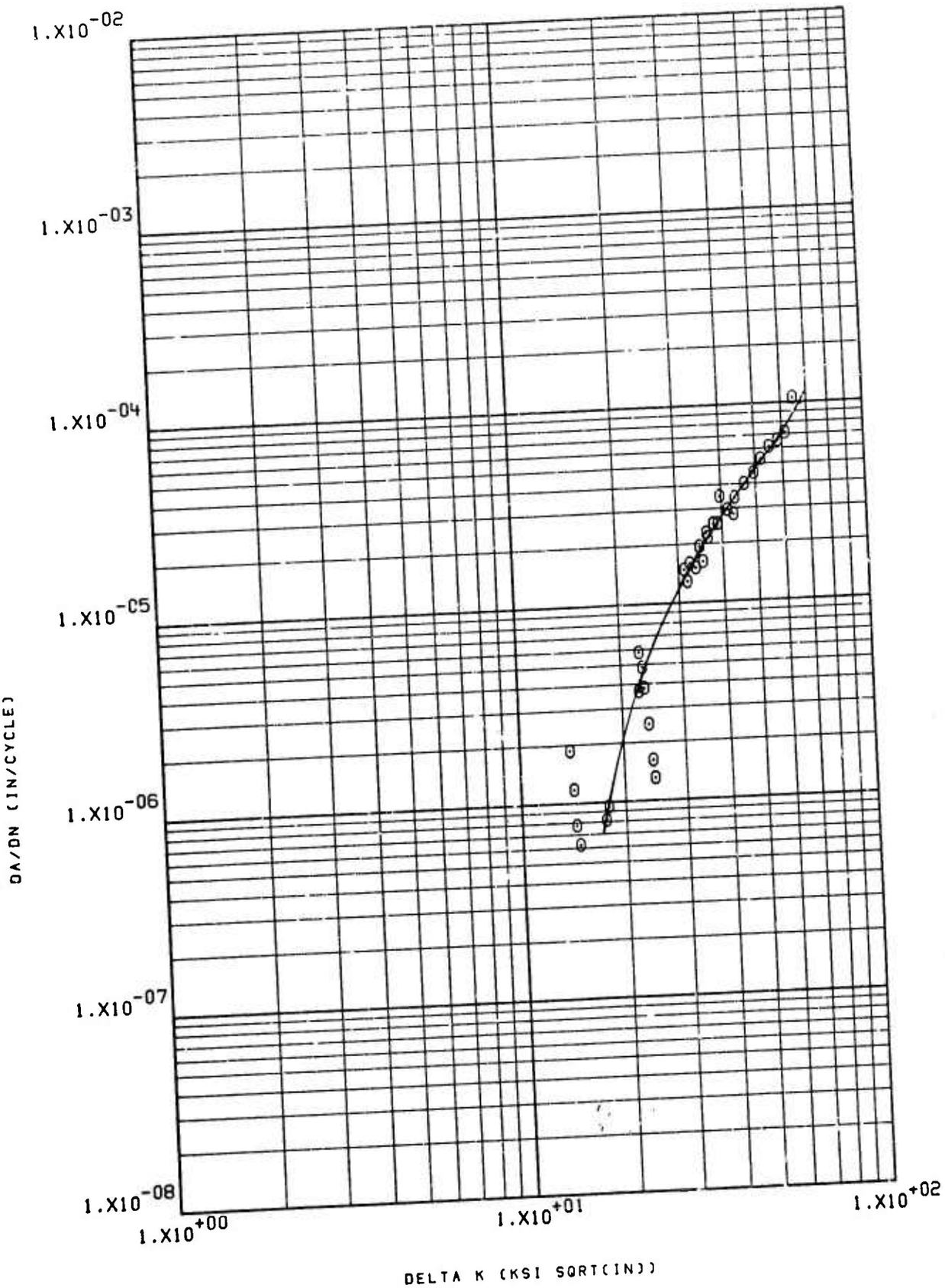


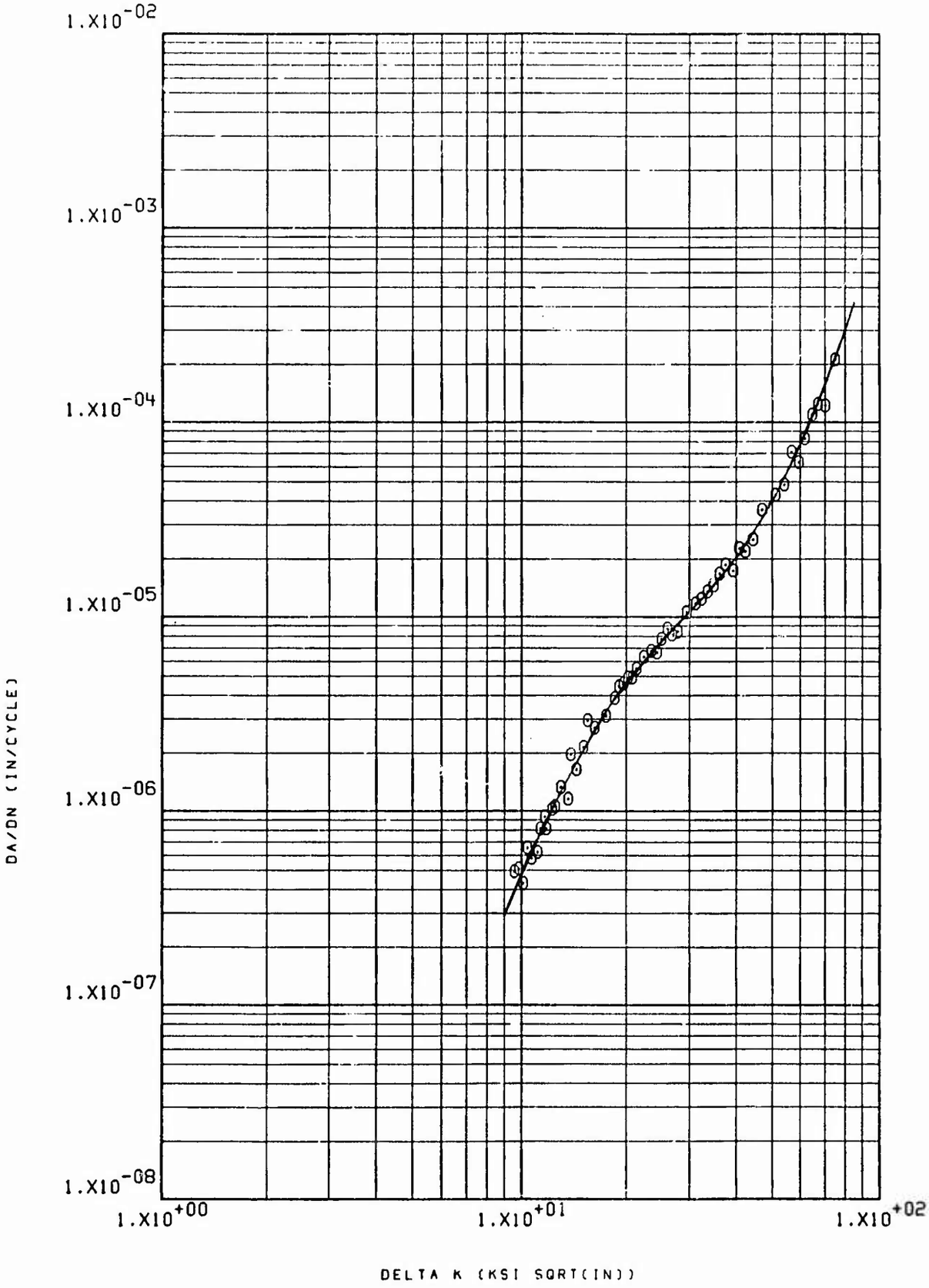
37 NRW 30-2 HP- 9-4-.20 H.T. 100□ HUMIDITY RT R=0.08 6CPM



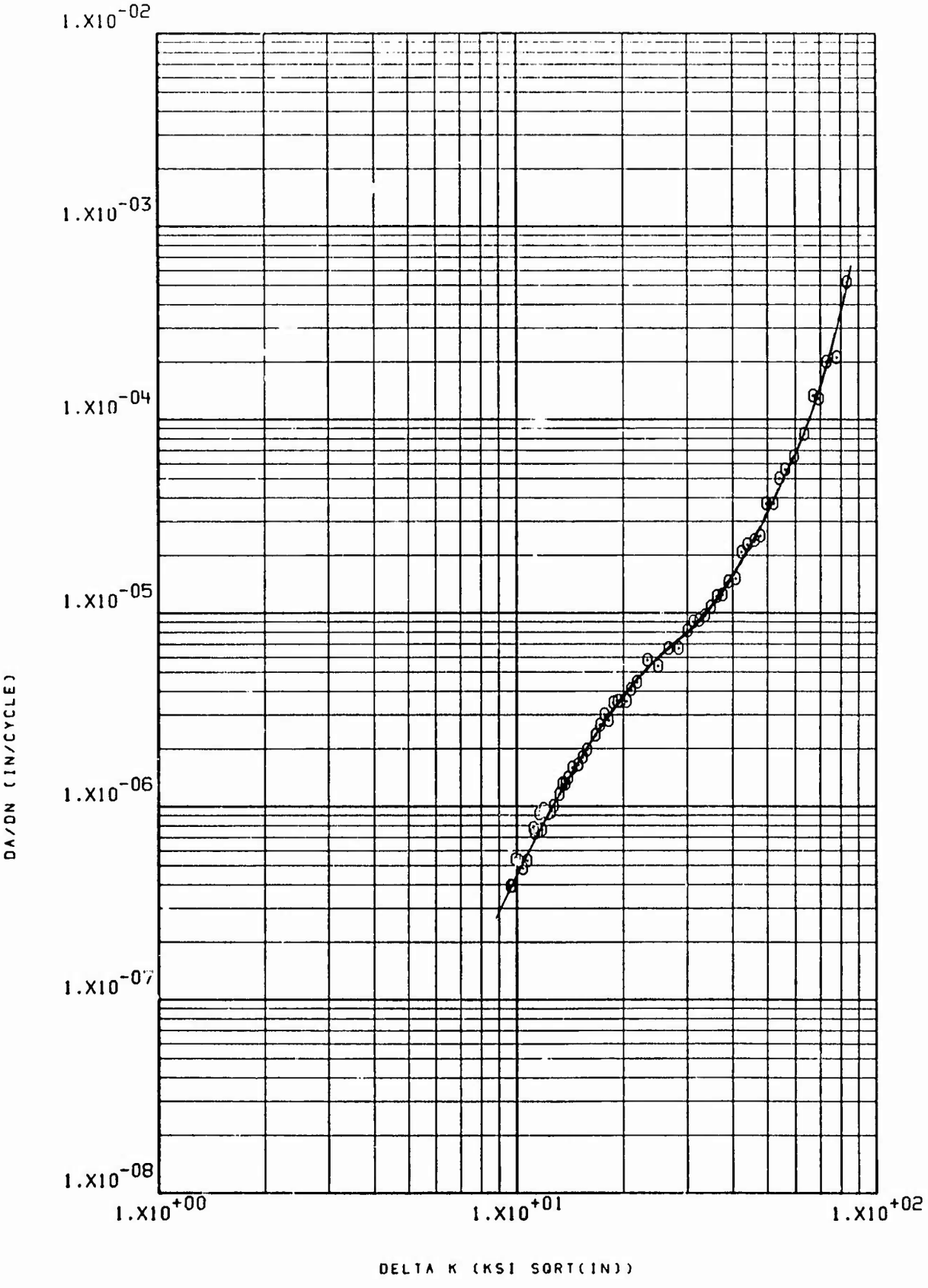
37 NRW 30-3 9-4-20 HT LHA RT R=.08 360CPM



37 NRW 30-4 HP-9-4-.20 H.T. STW RT R=0.08 6CPM



37 NRW 30-7 HP 9-4-.20 HT L.H.A. R.T. 360CPM R=.08



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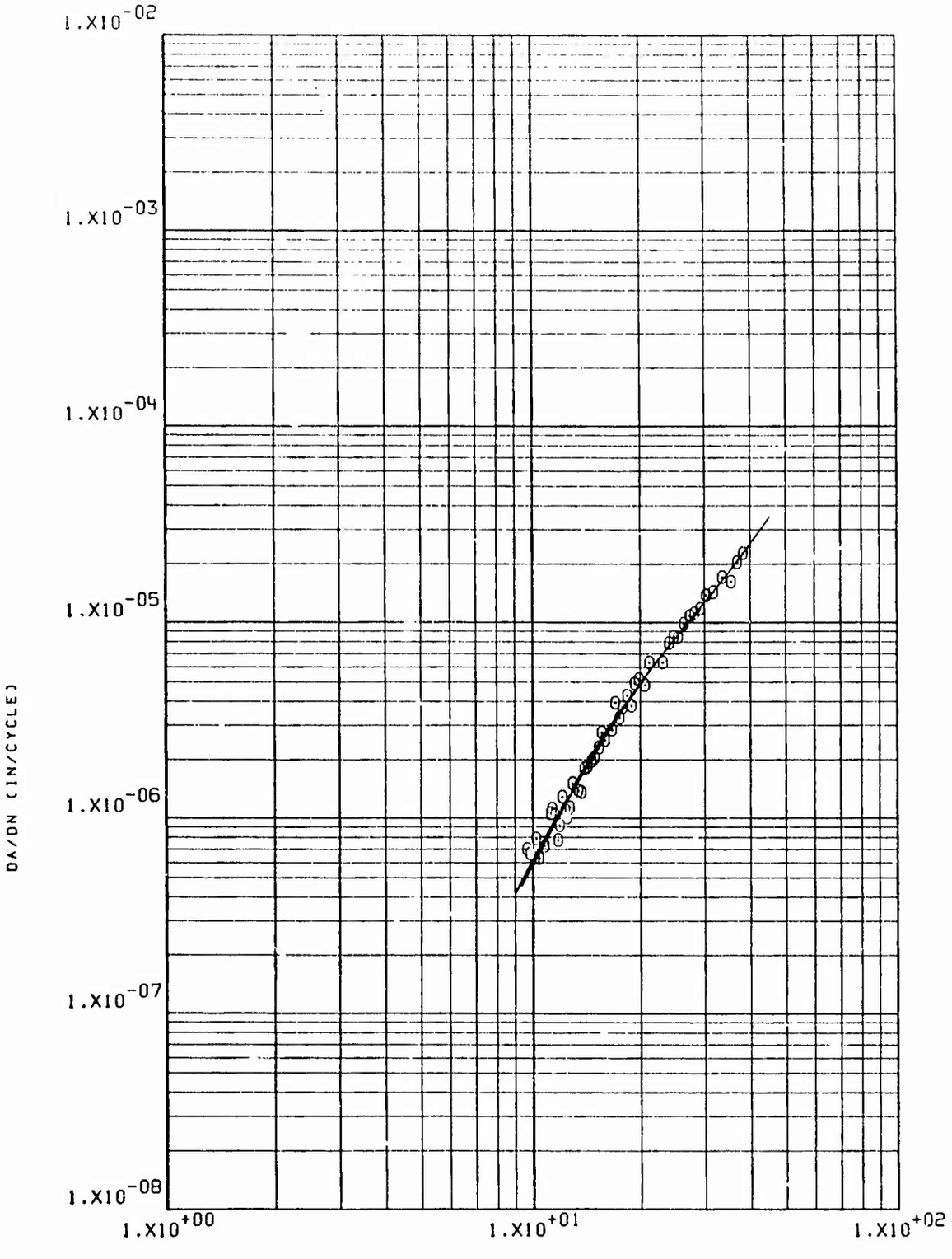

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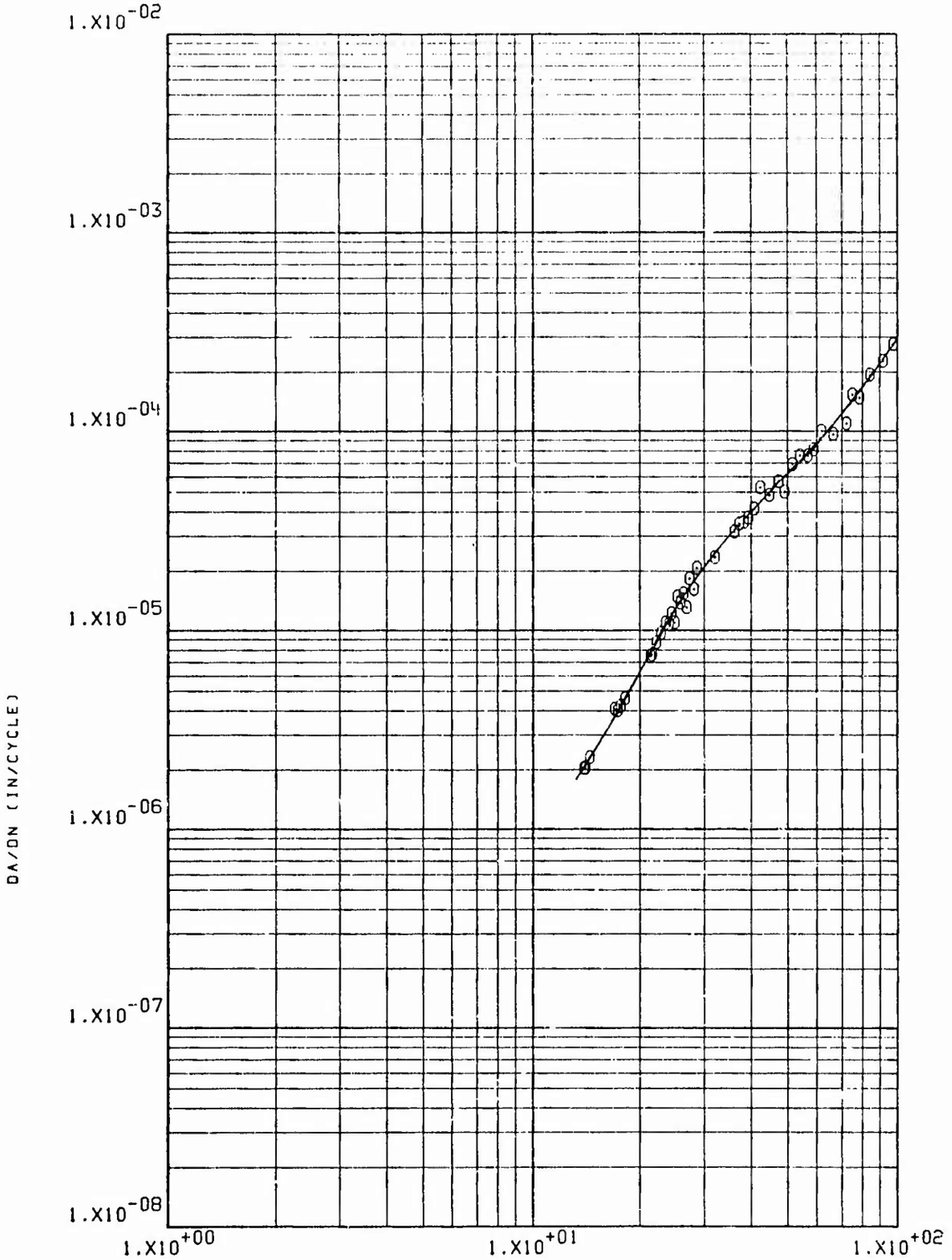
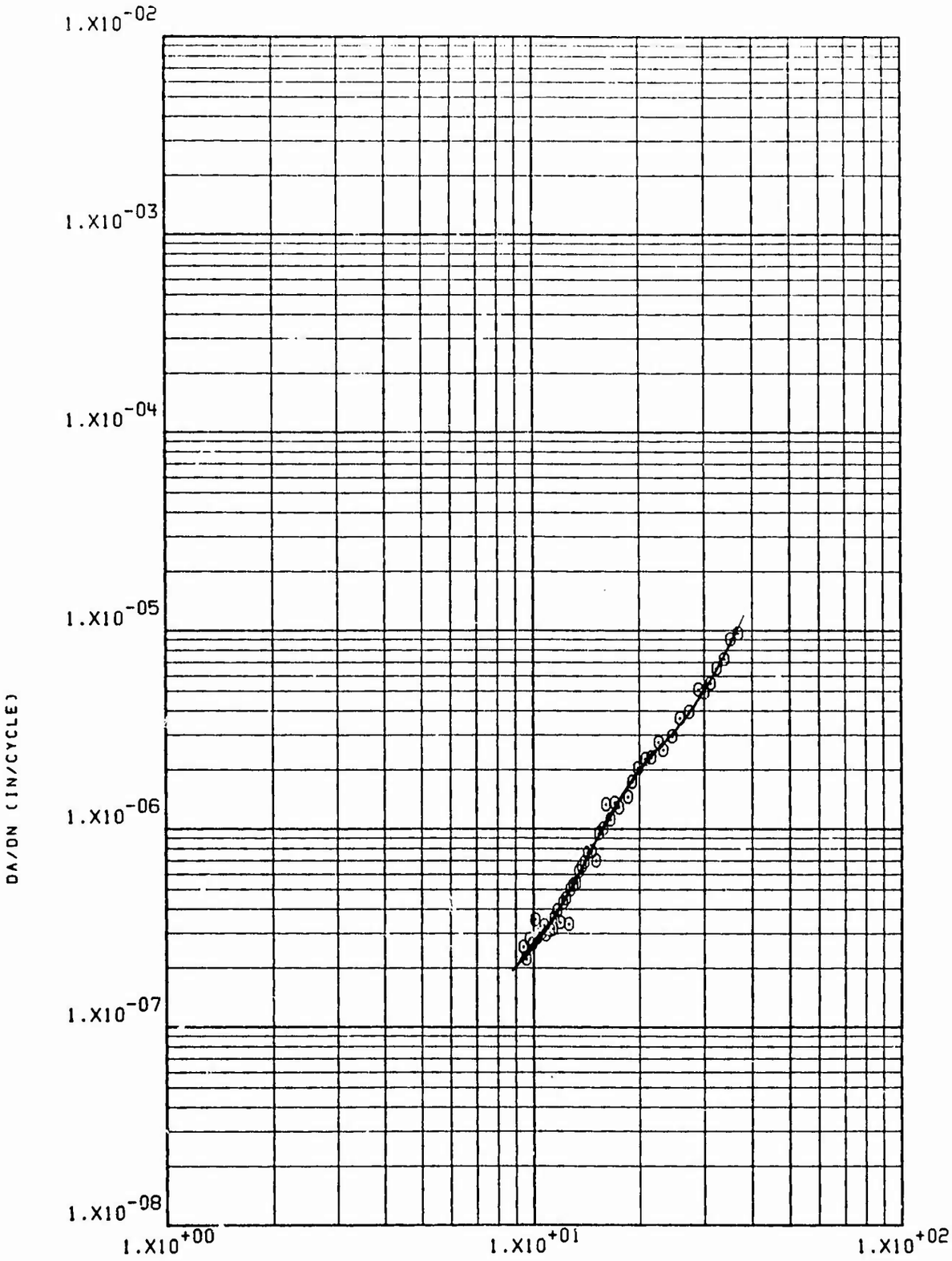
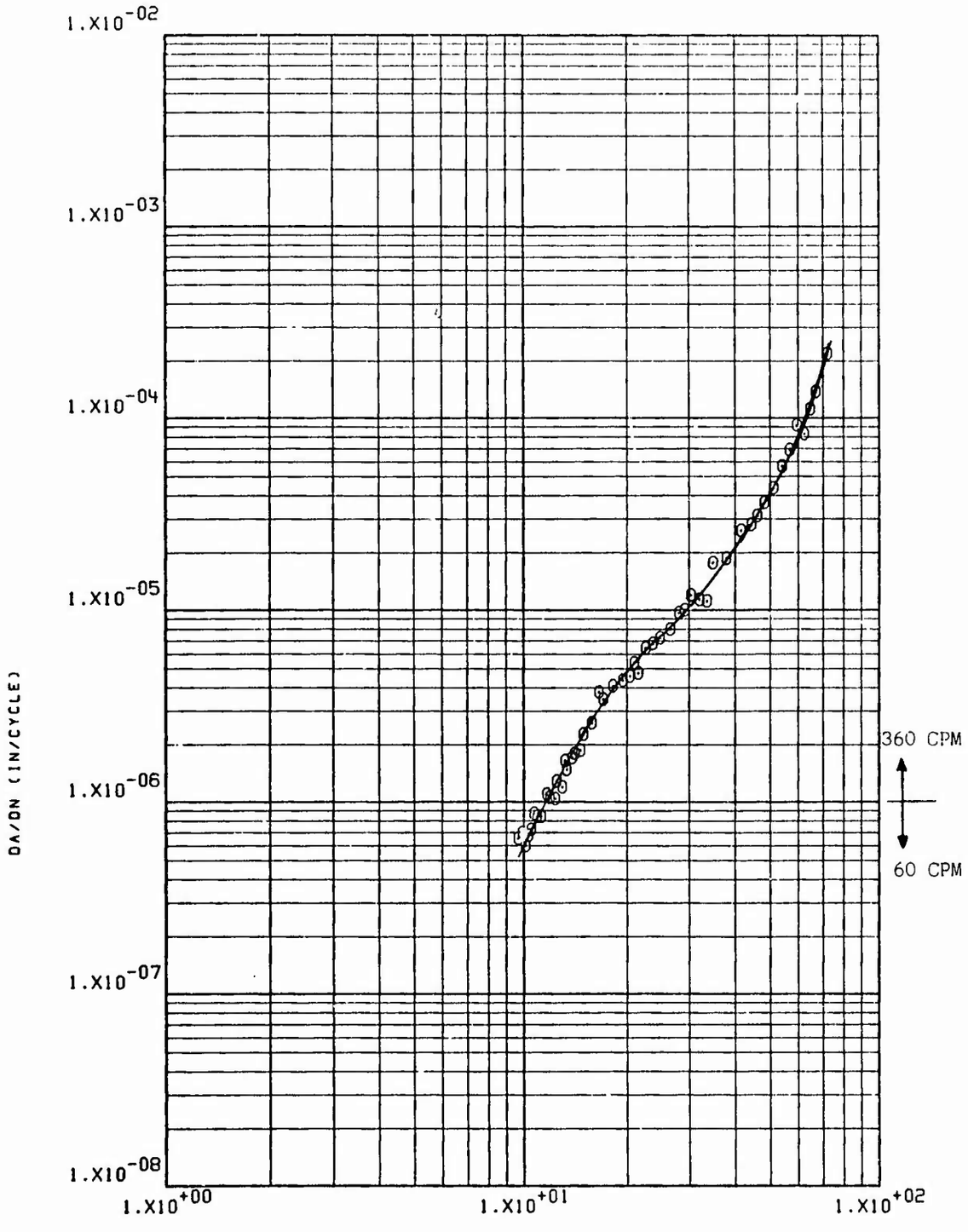


37 NRV 30-12 9-4-20 HT DIST WATER RT R=.08 6CPM



37 NRW 30-13 9-4-20 HT LHA RT R=.08 360CPM



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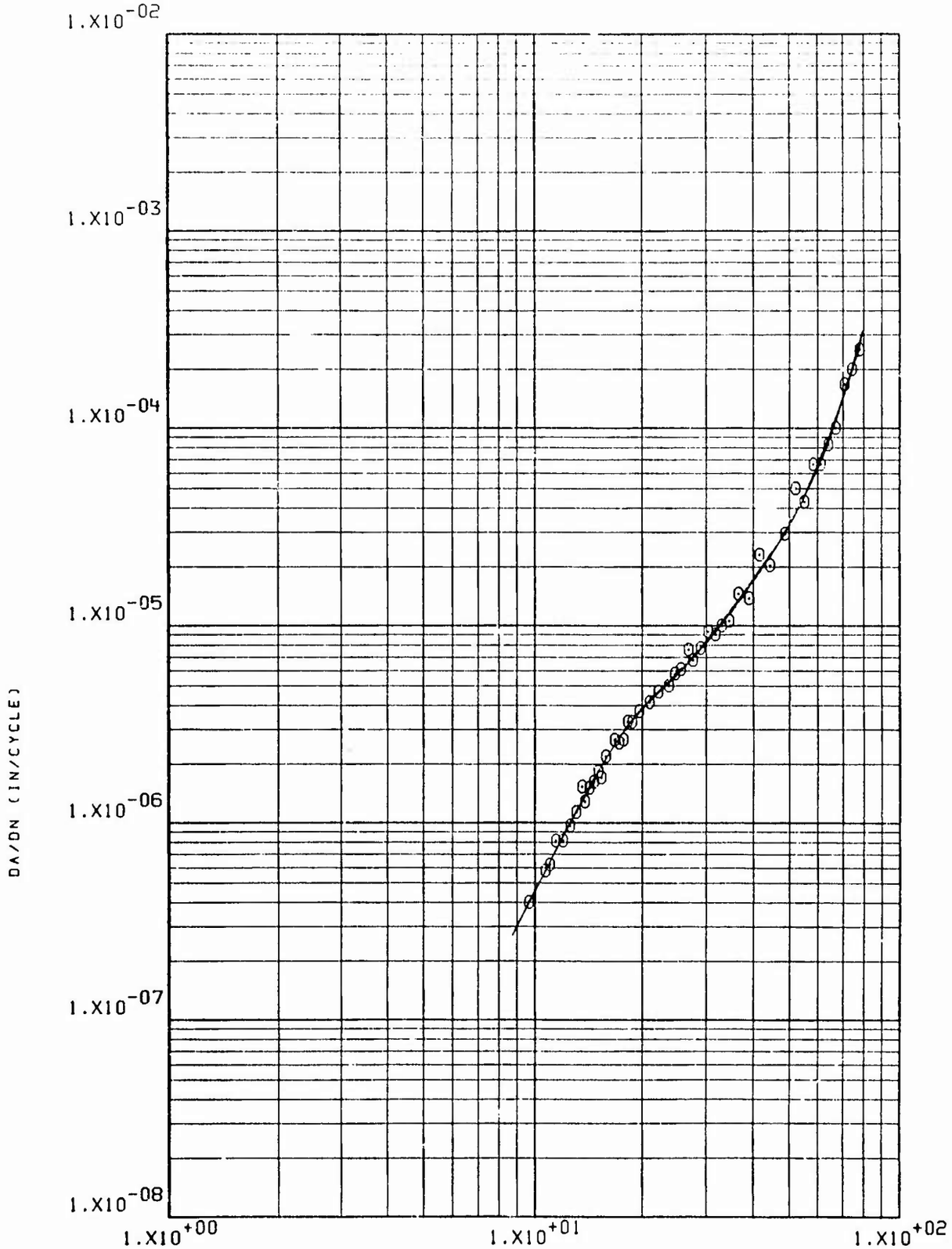
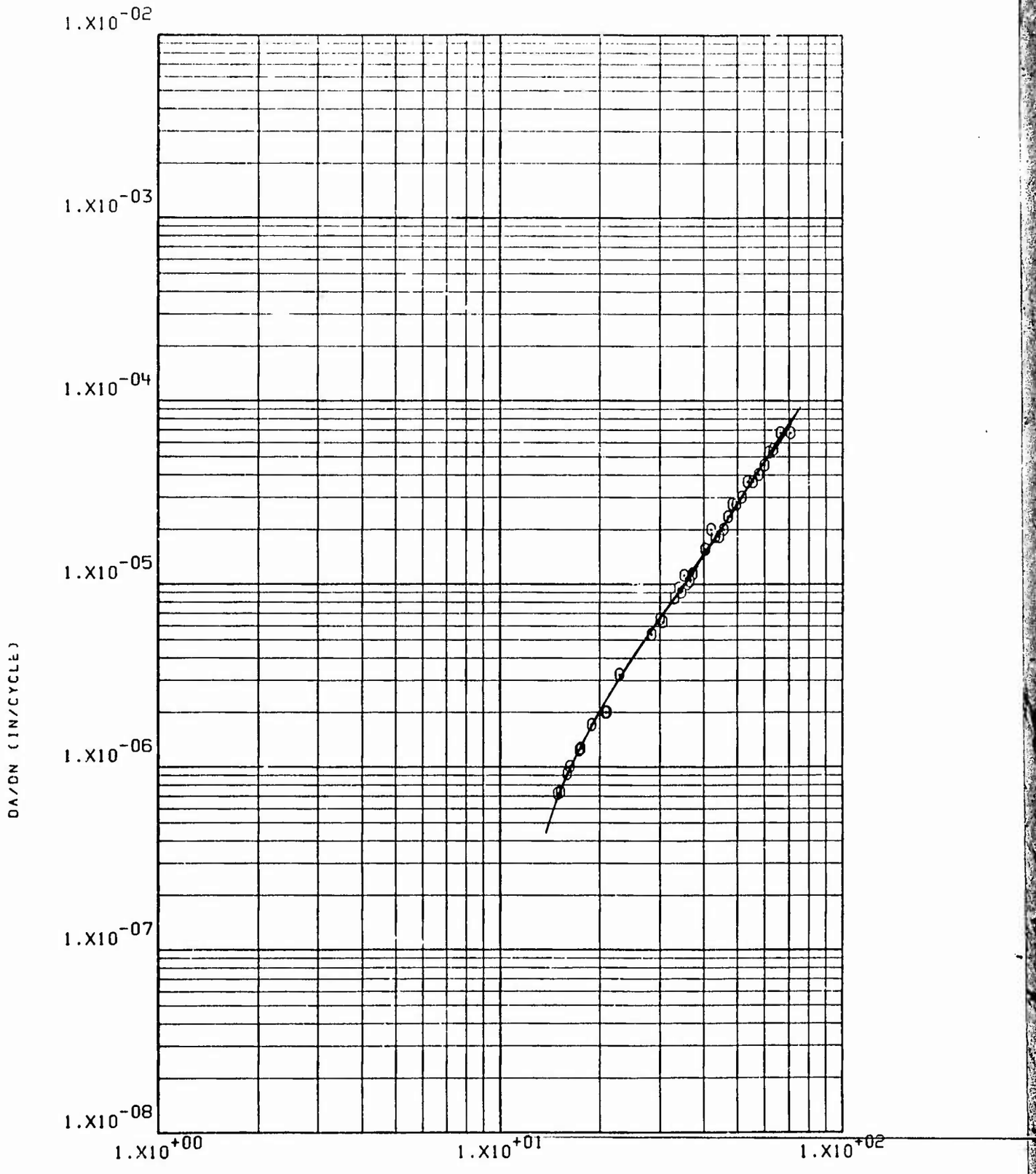


37 NWR 30-15 HP 9-4-.20 HT L.H.A. -65F 60CPM R=.08



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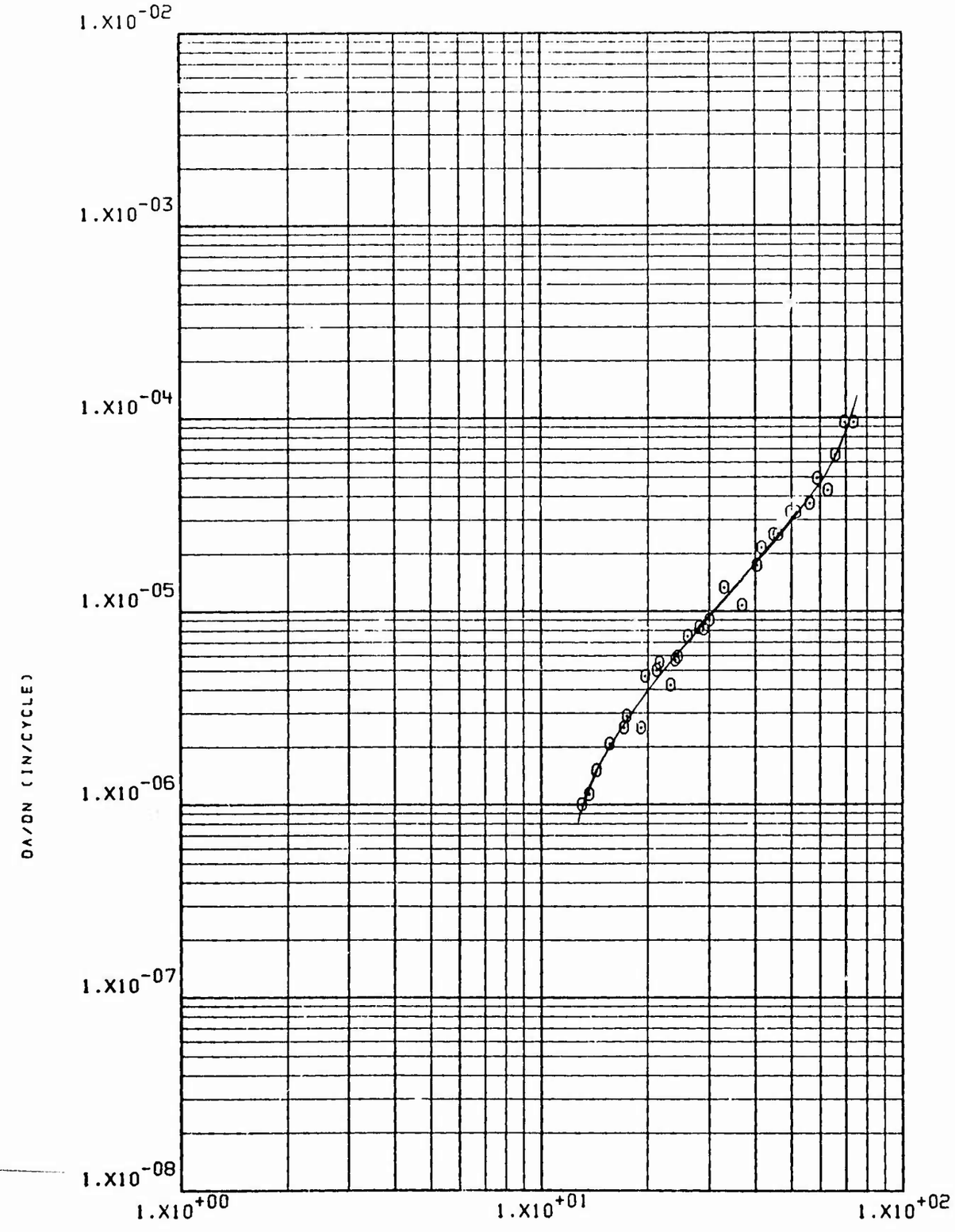
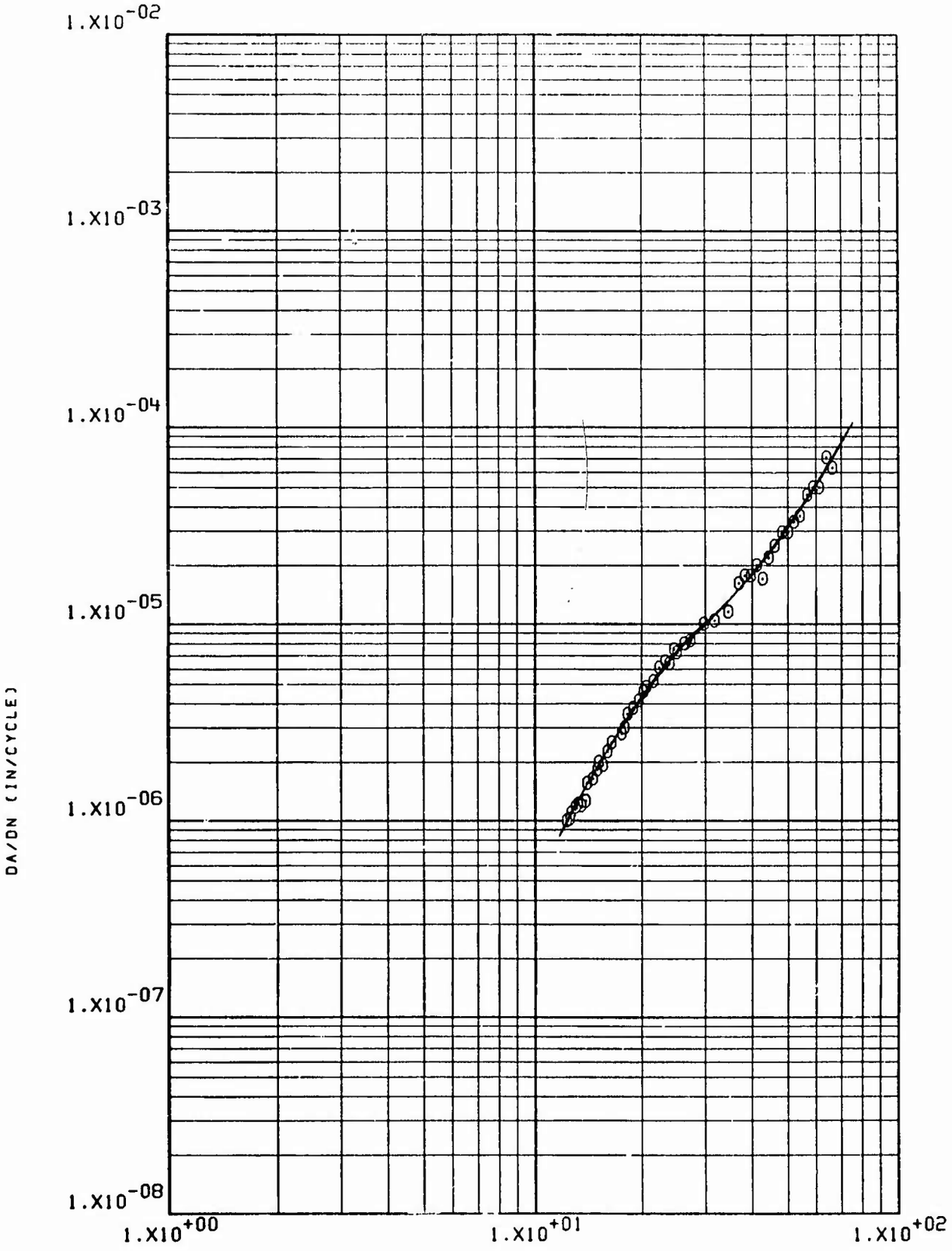
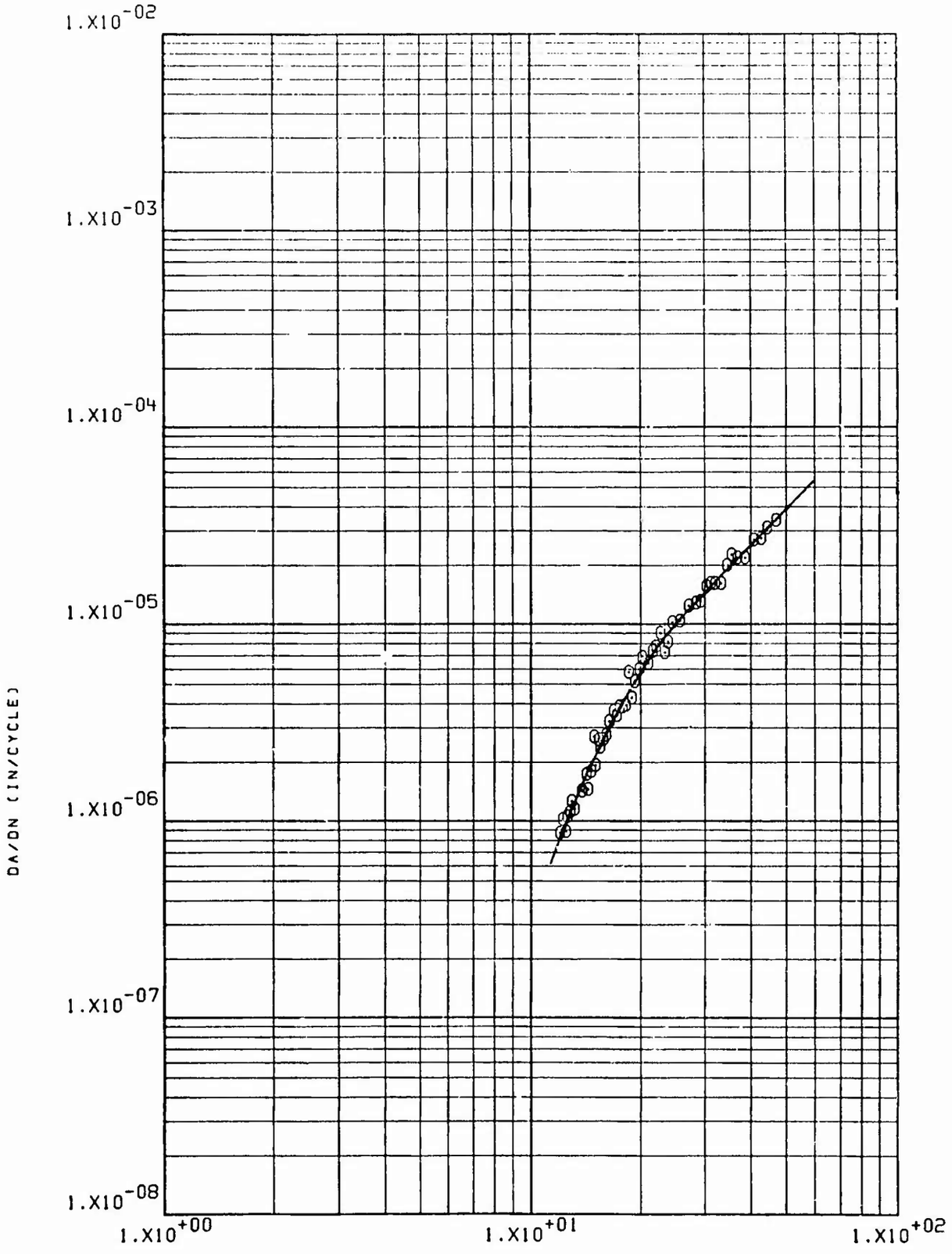


37 NWR 31-2 HP 9-4-.20 HT LHA RT R=.08 60CPM



37 NRW 31-5 HP 9-4-20 HT LHA RT R=.08 360CPM



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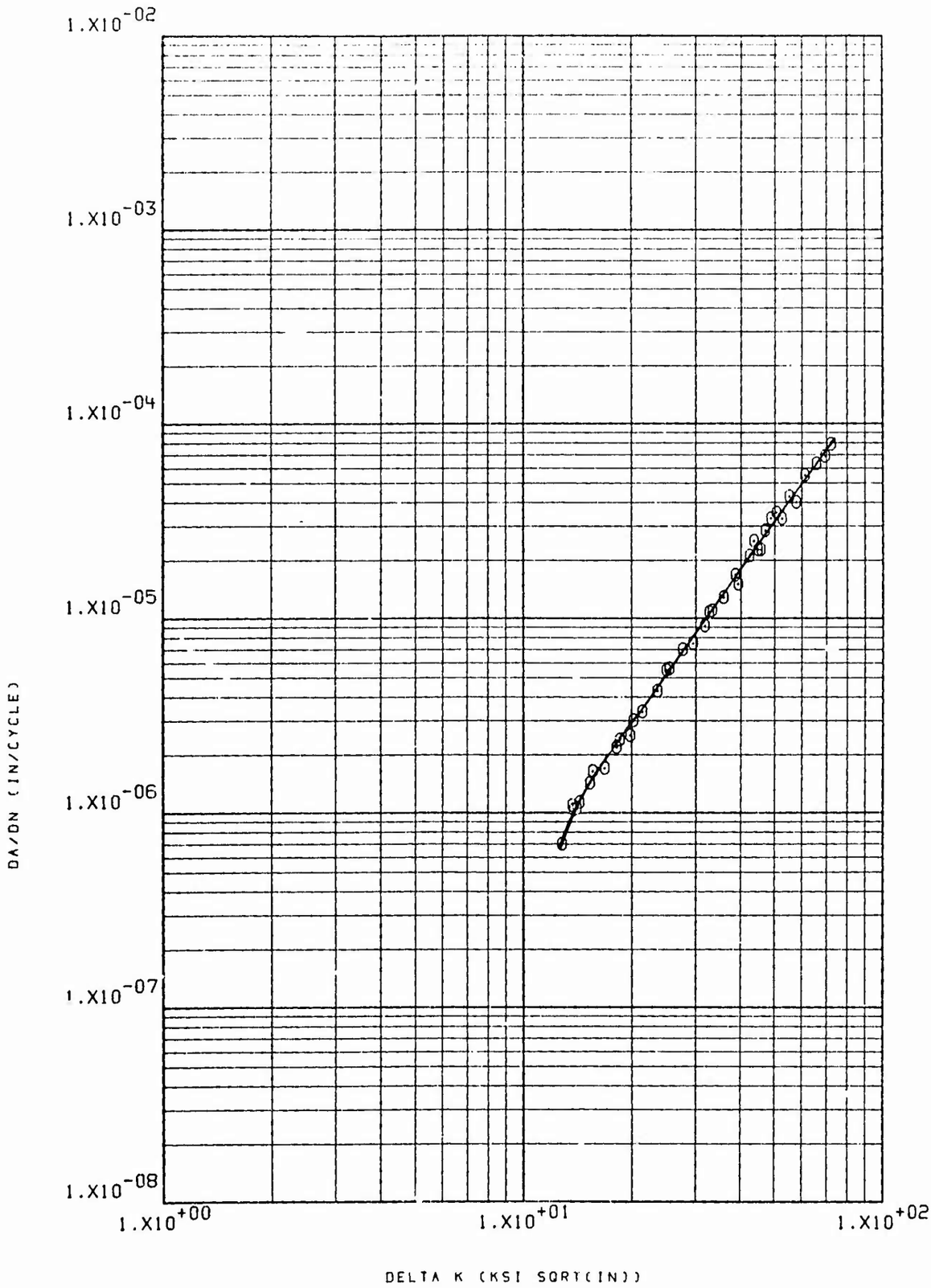
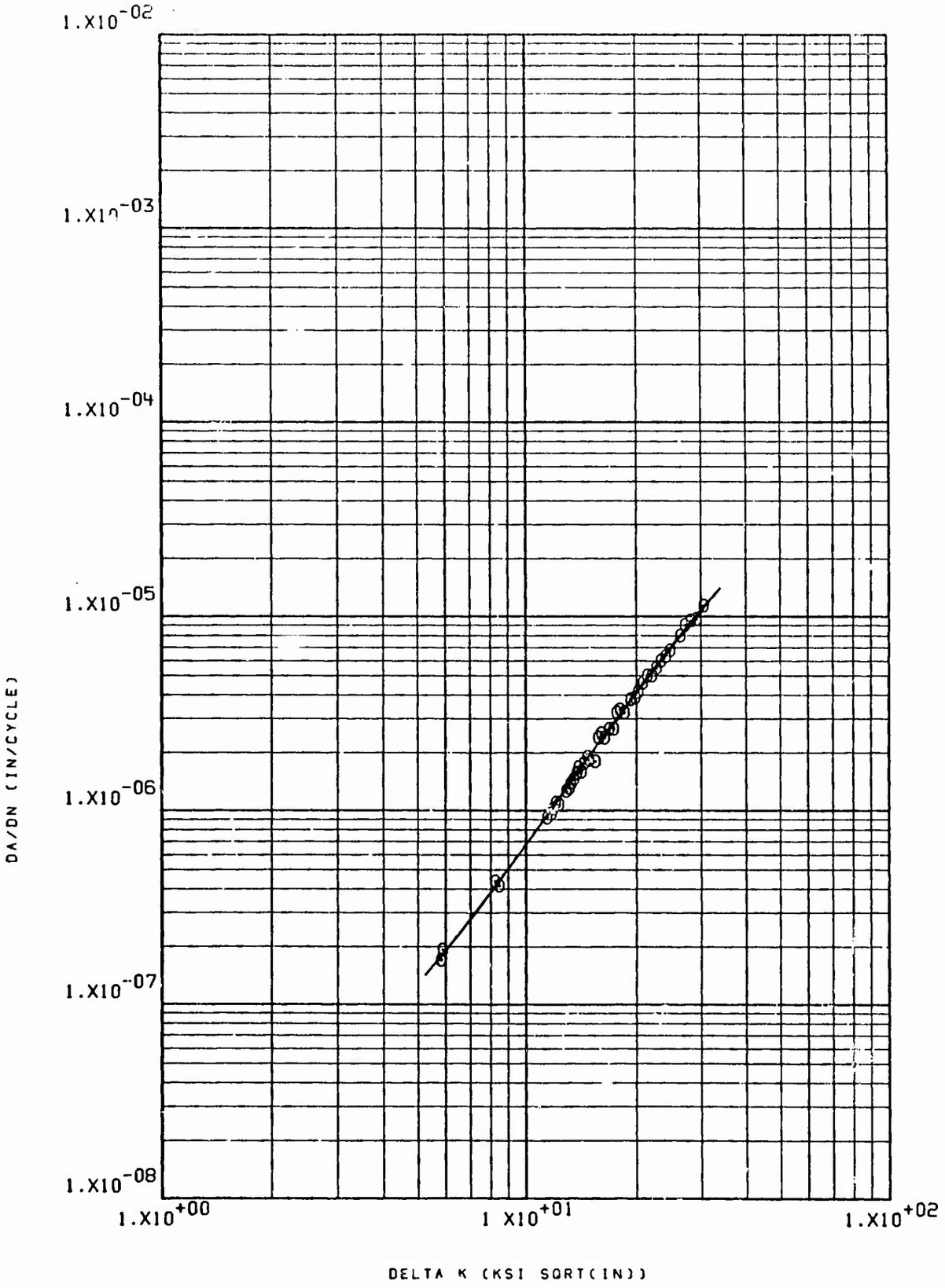
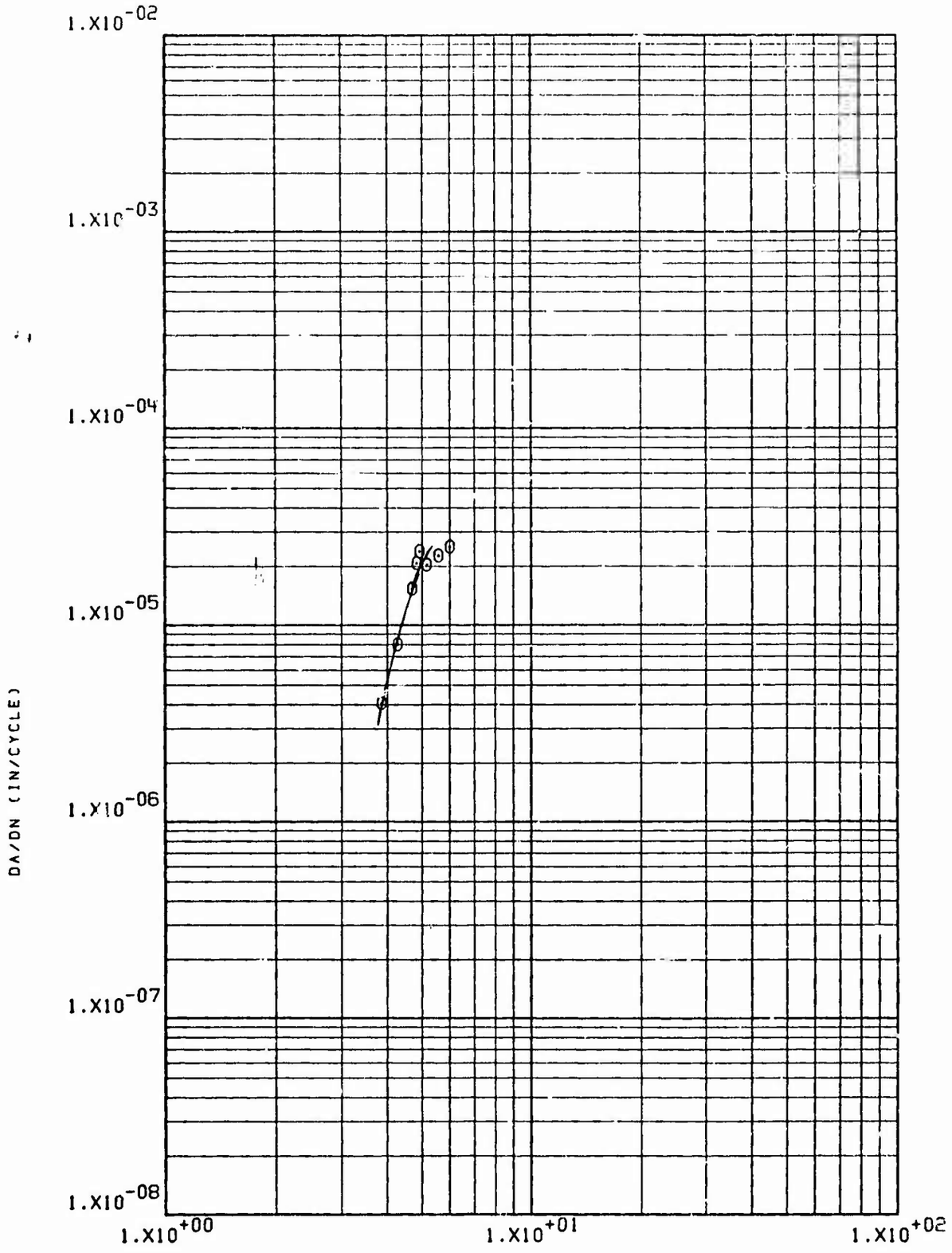


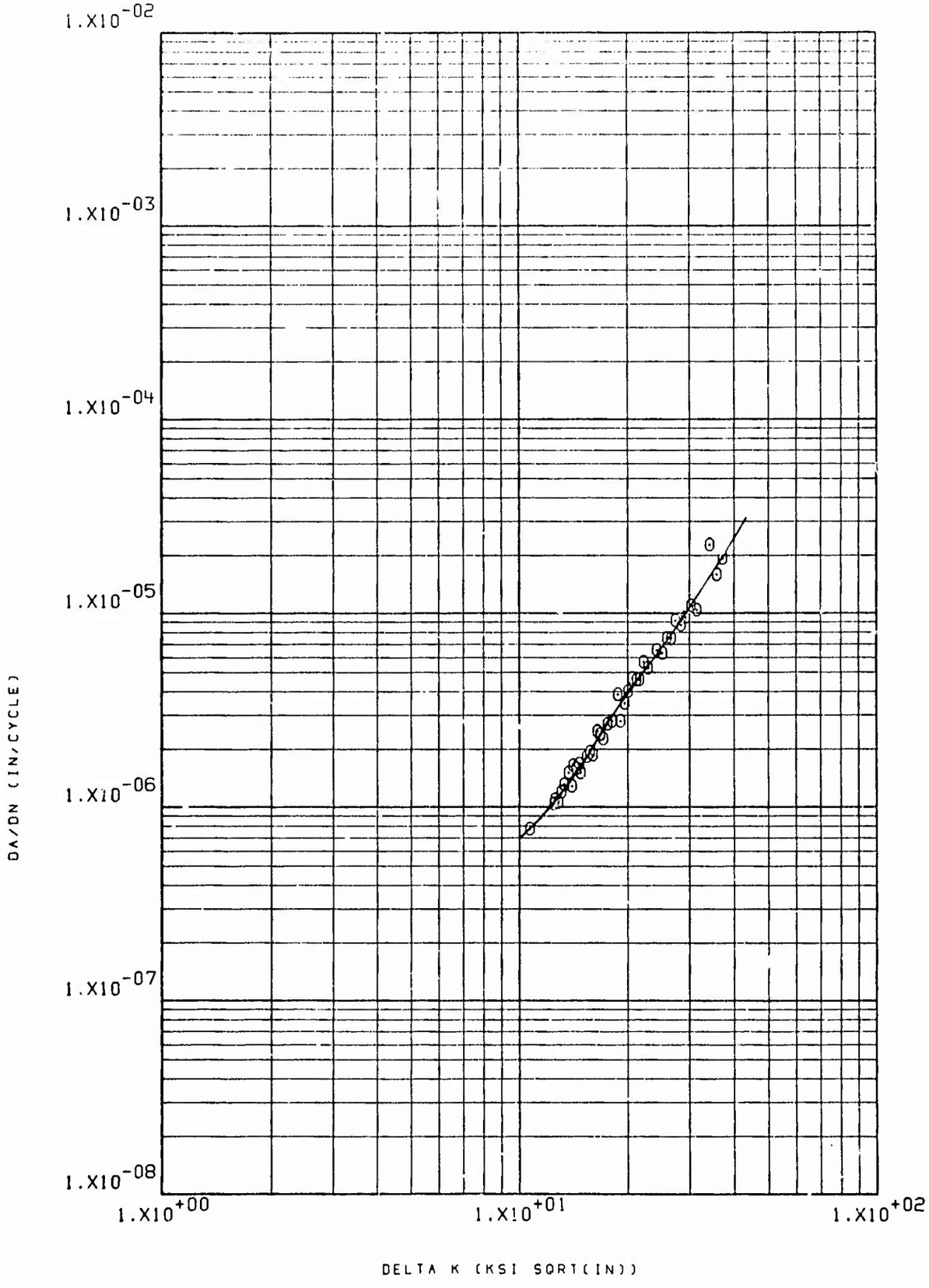
37 NRW 31-7 HP 9-4-20 HT LHA -65 R=.08 60CPM



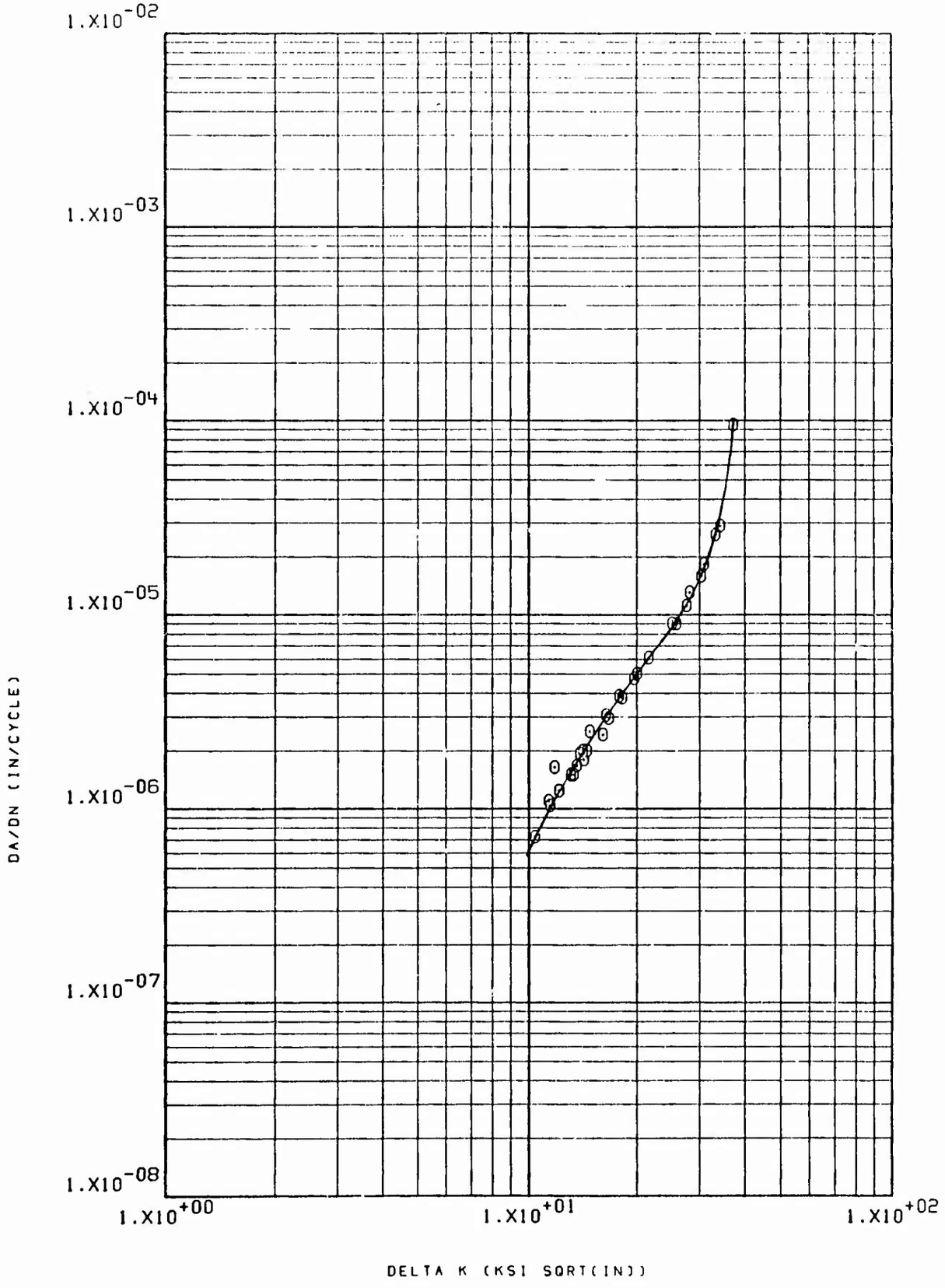
39 NRW 55-7 300M HT 360 CPM LHA RT R=.08



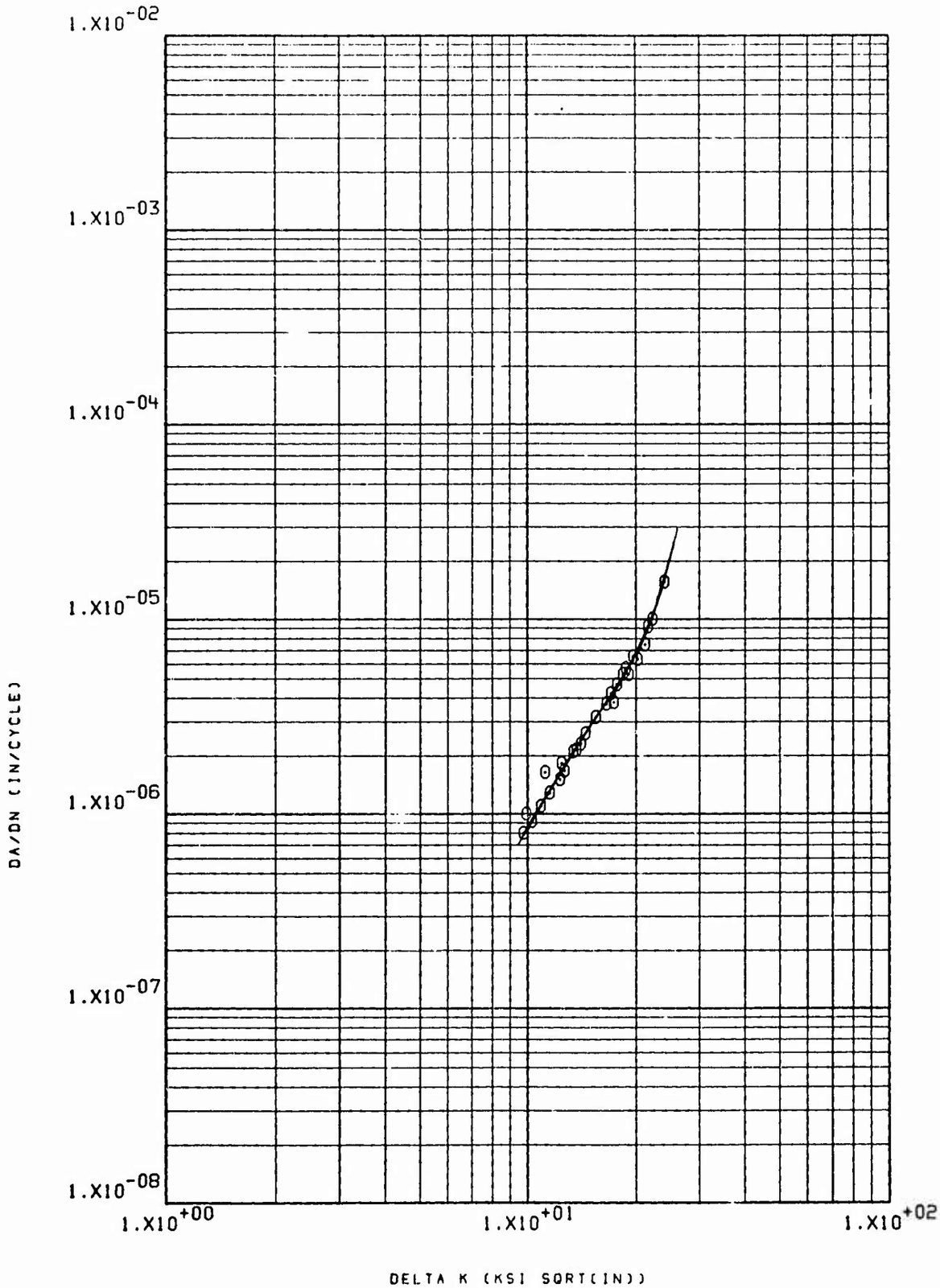
33 NRW 55-8 300M HT TR SUMP RT R=.5 60CPM



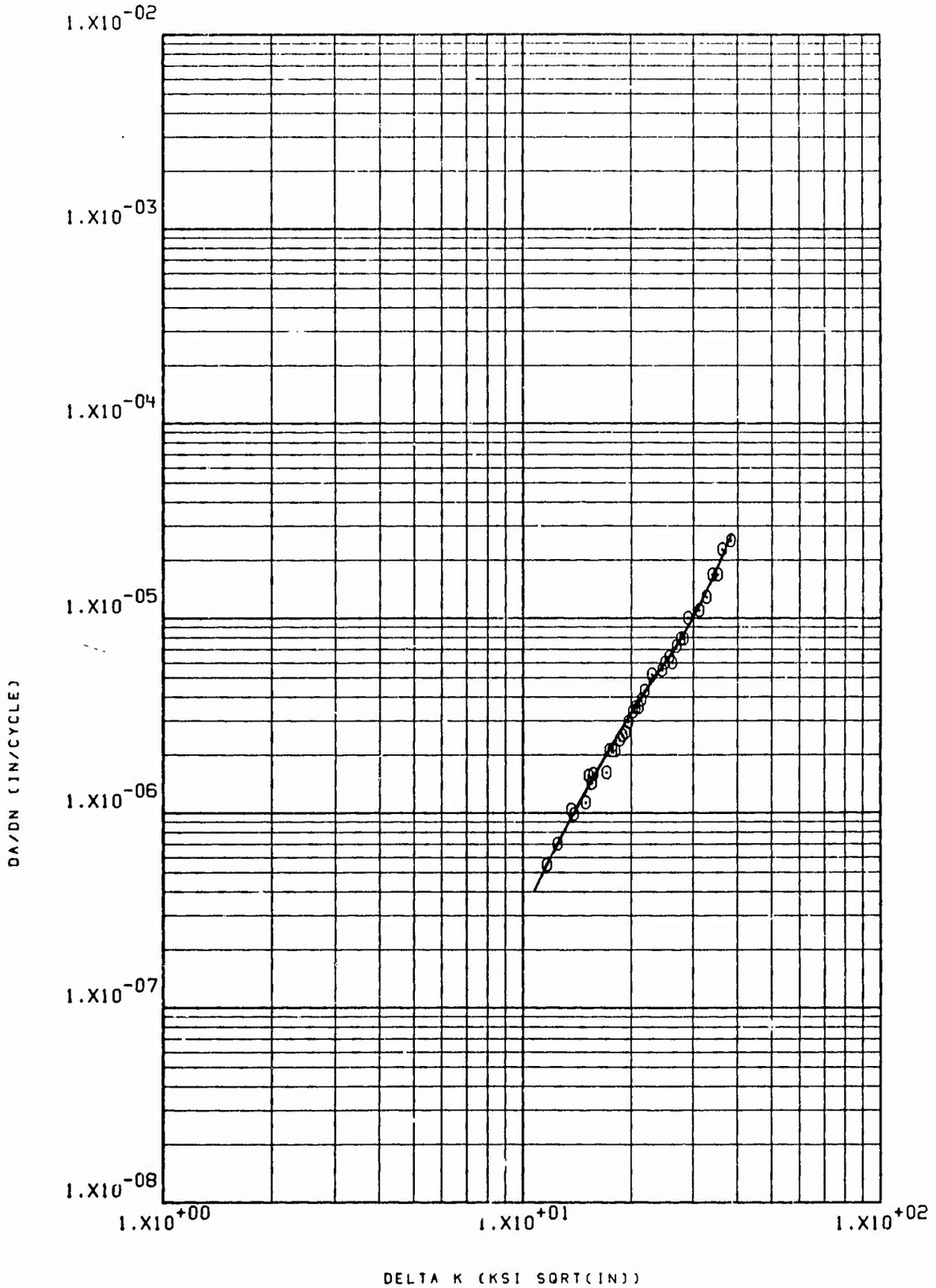
39 NRW 55-9 300M HT LHA RT R=.08 60CPM



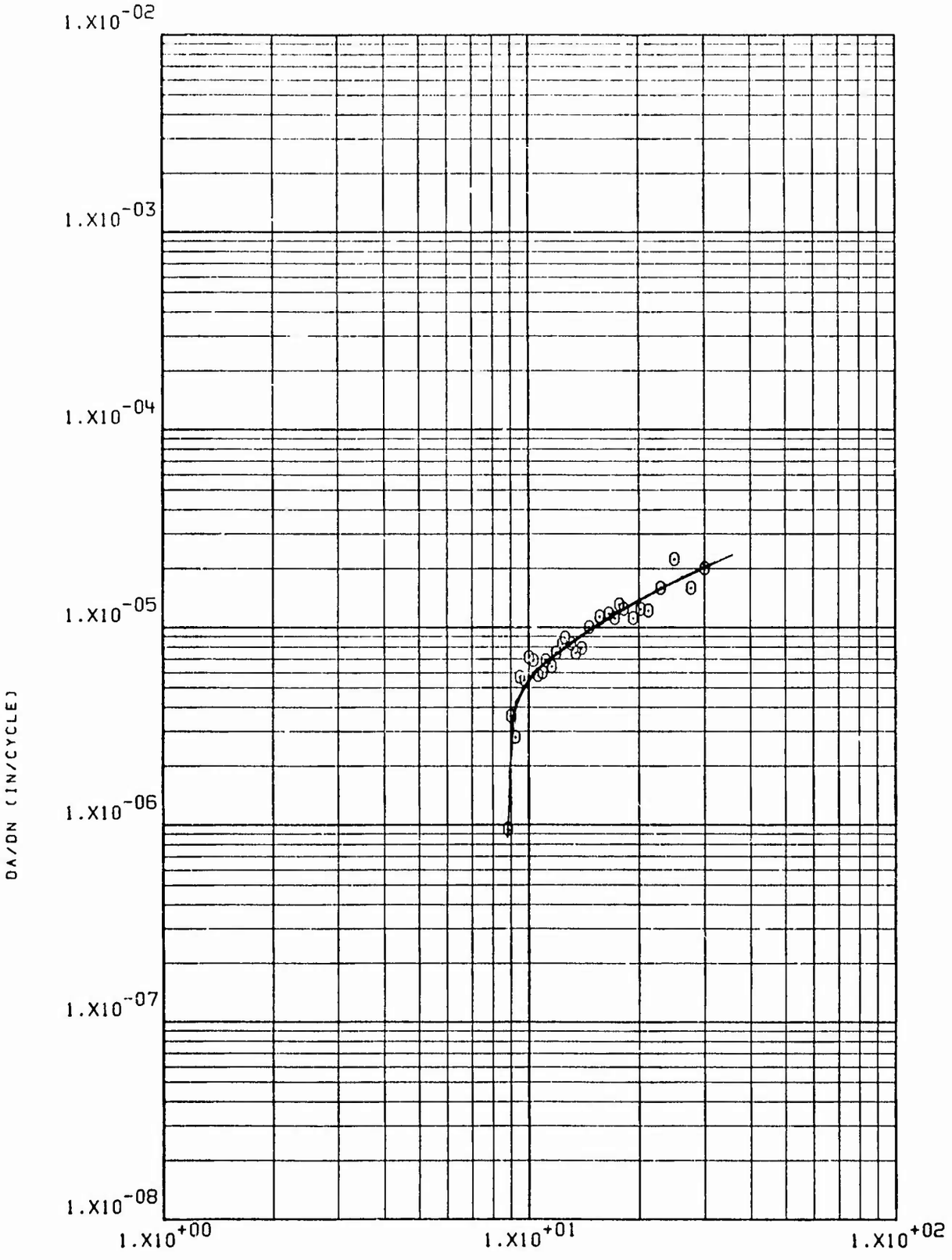
39 NRW 55-10 300M HT TR LHA RT R=.3 360CPM



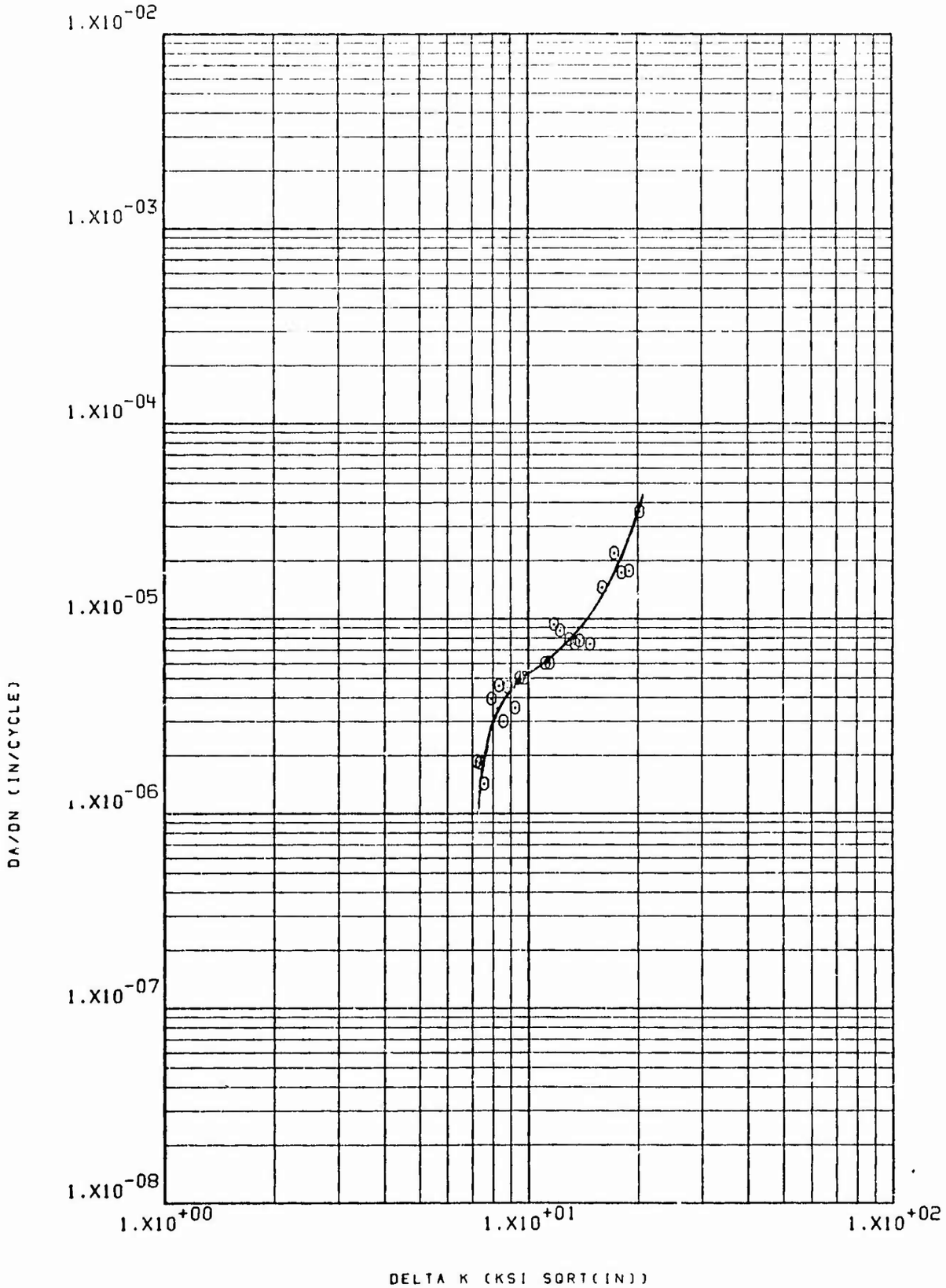
39 NRW 55-11 300M HT TR LHA RT R=.5 360CPM



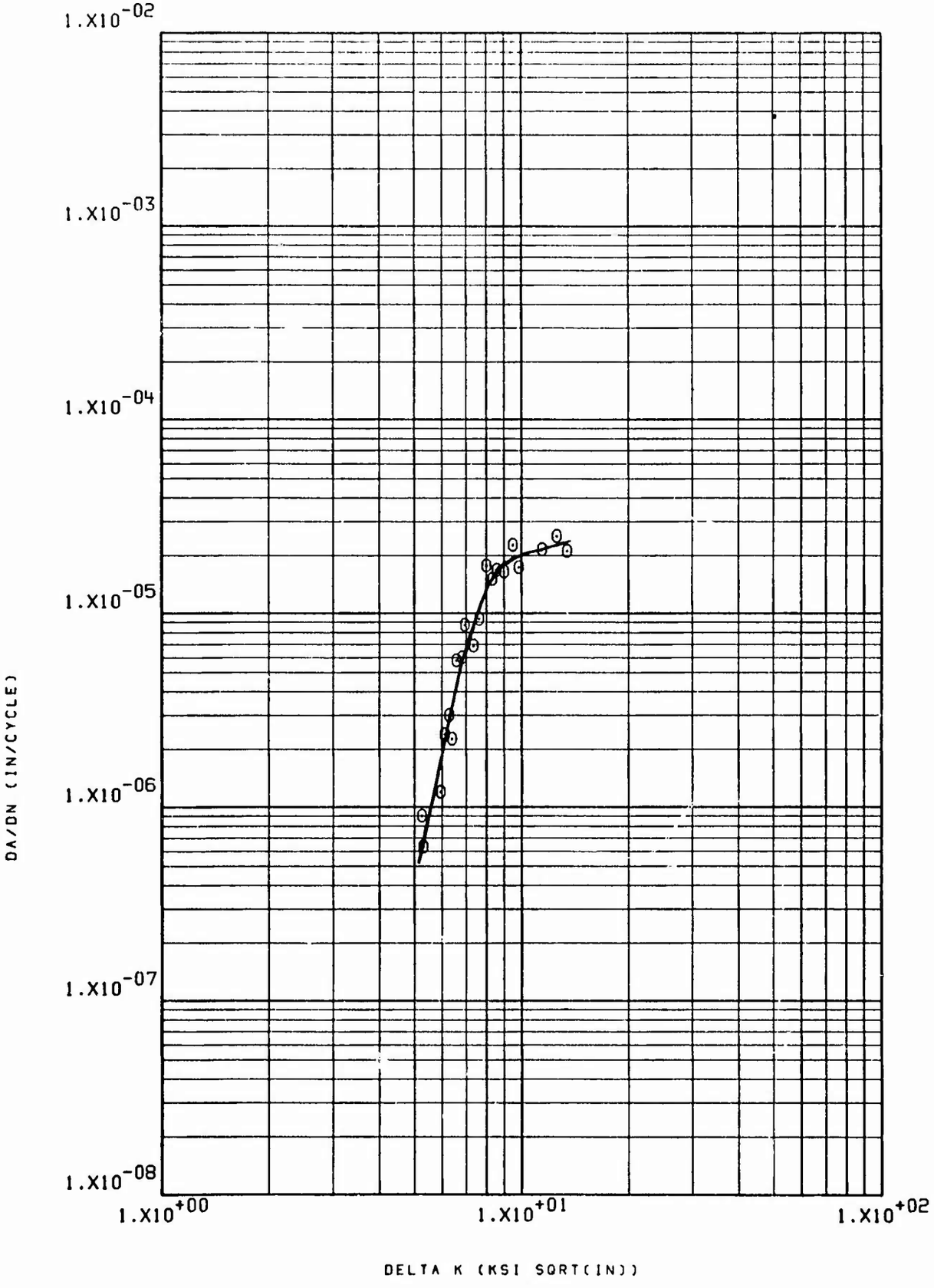
39 NRW 55-12 300M HT -65F LHA R=.08 360CPM



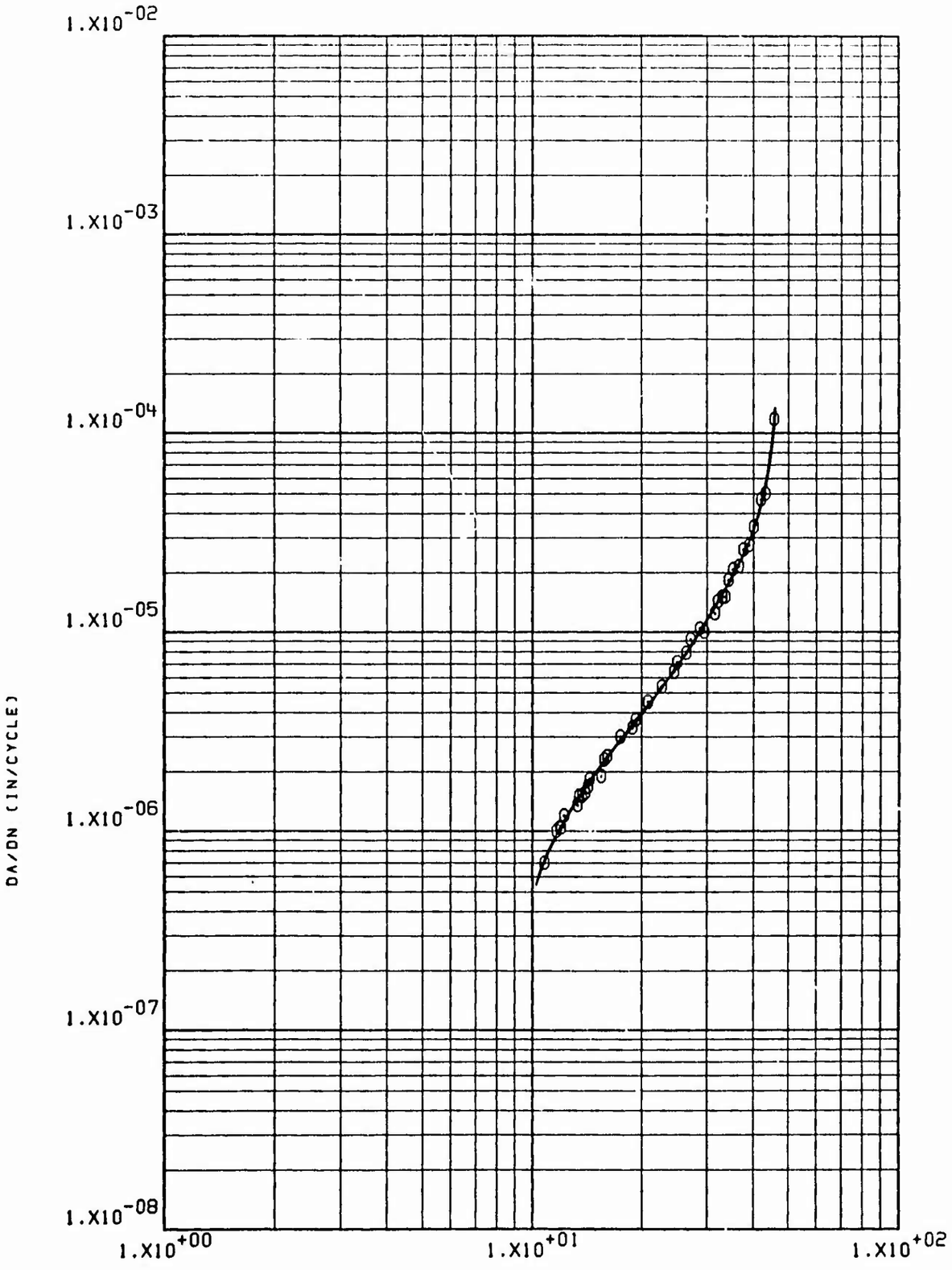
39 NRW 55-13 300M HT SUMP RT R=.08 60CPM



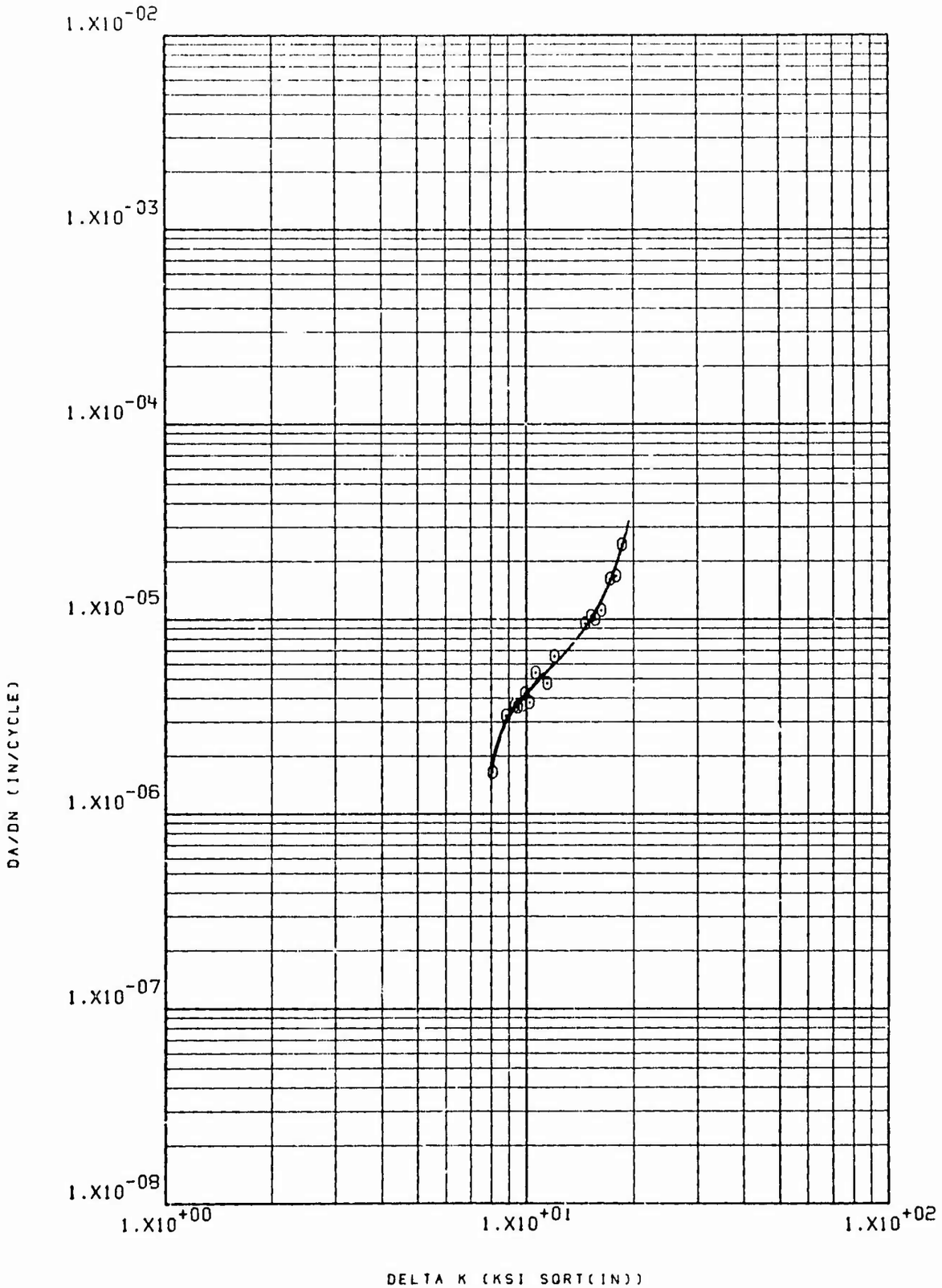
39 NRW 55-14 300M HT SUMP RT R=.3 60CPM



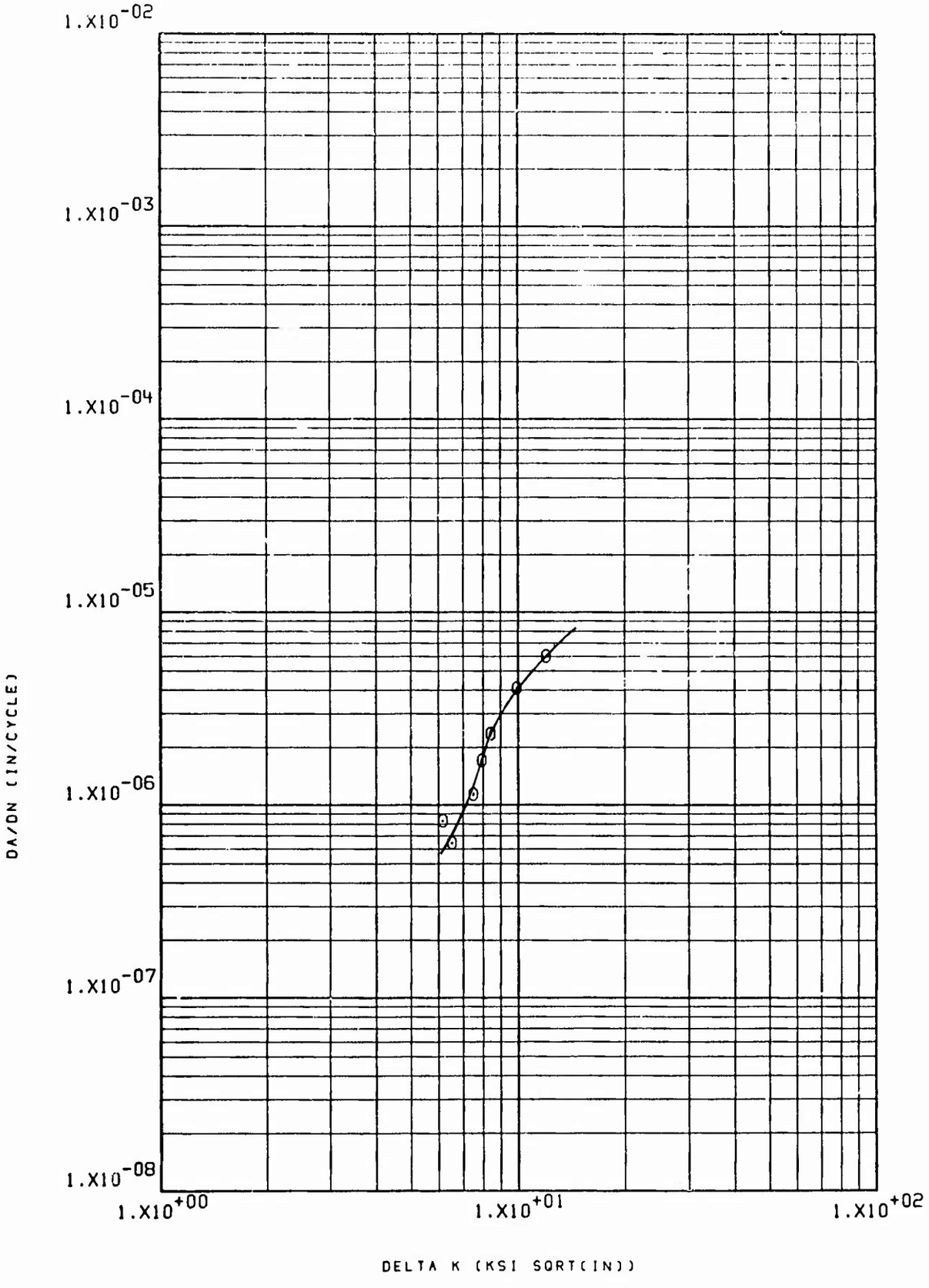
39 NRW 55-16 300M HT TR SUMP RT R=.5 60CPM



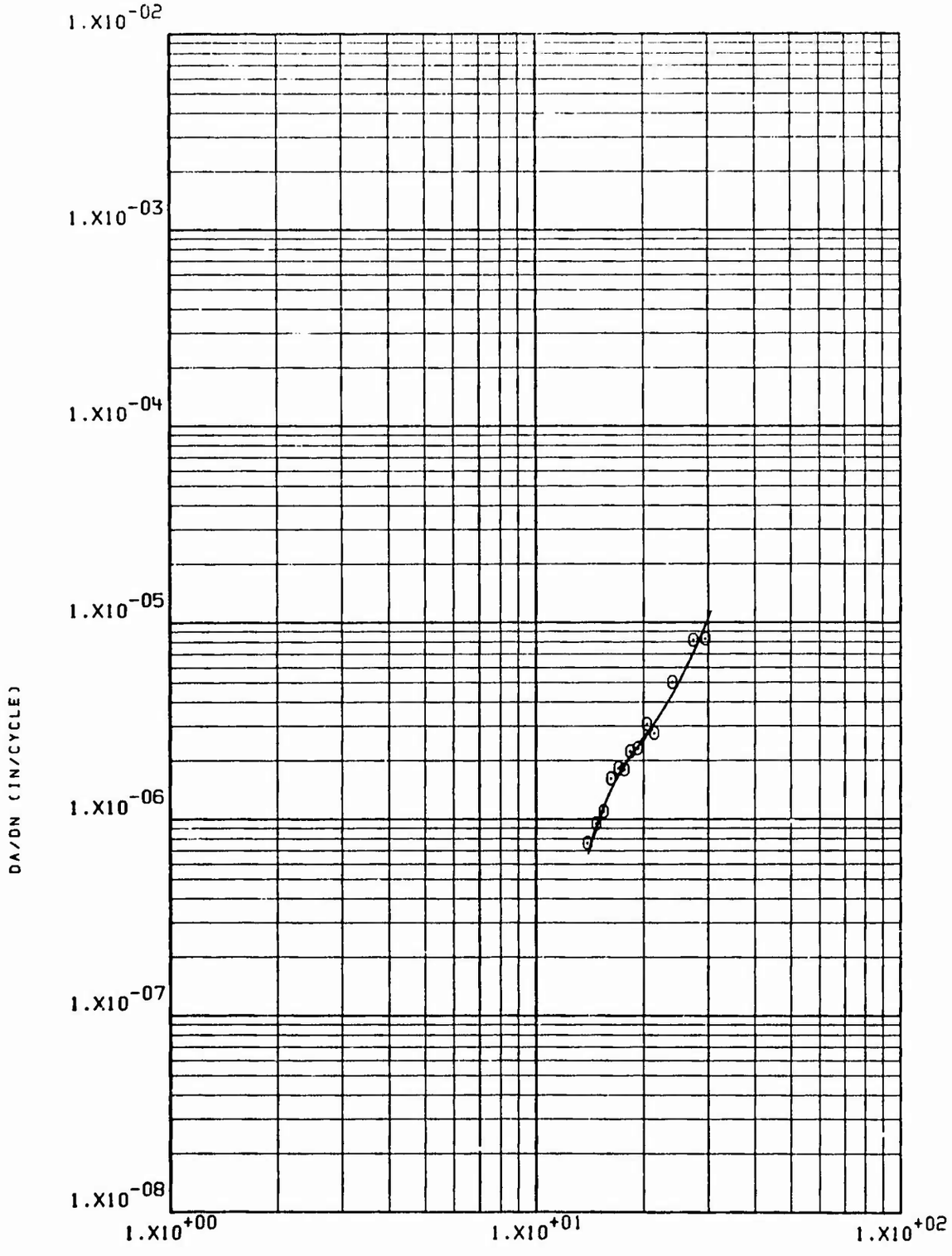
39 NWR 55-17 300M HT TR LHA RT R=.08 360CPM



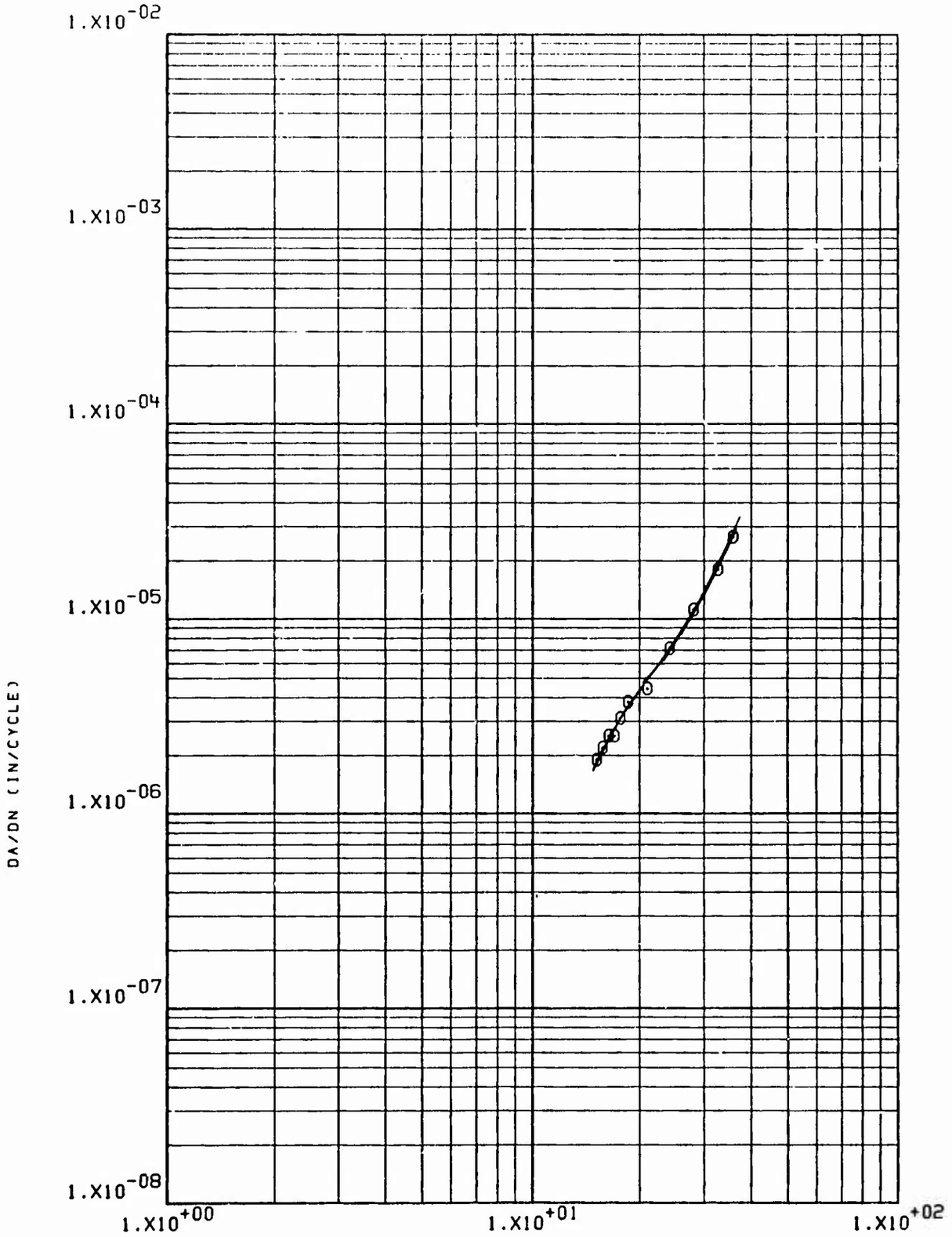
39 NWR 55-18 300M HT TR SUMP RT R=.08 60CPM



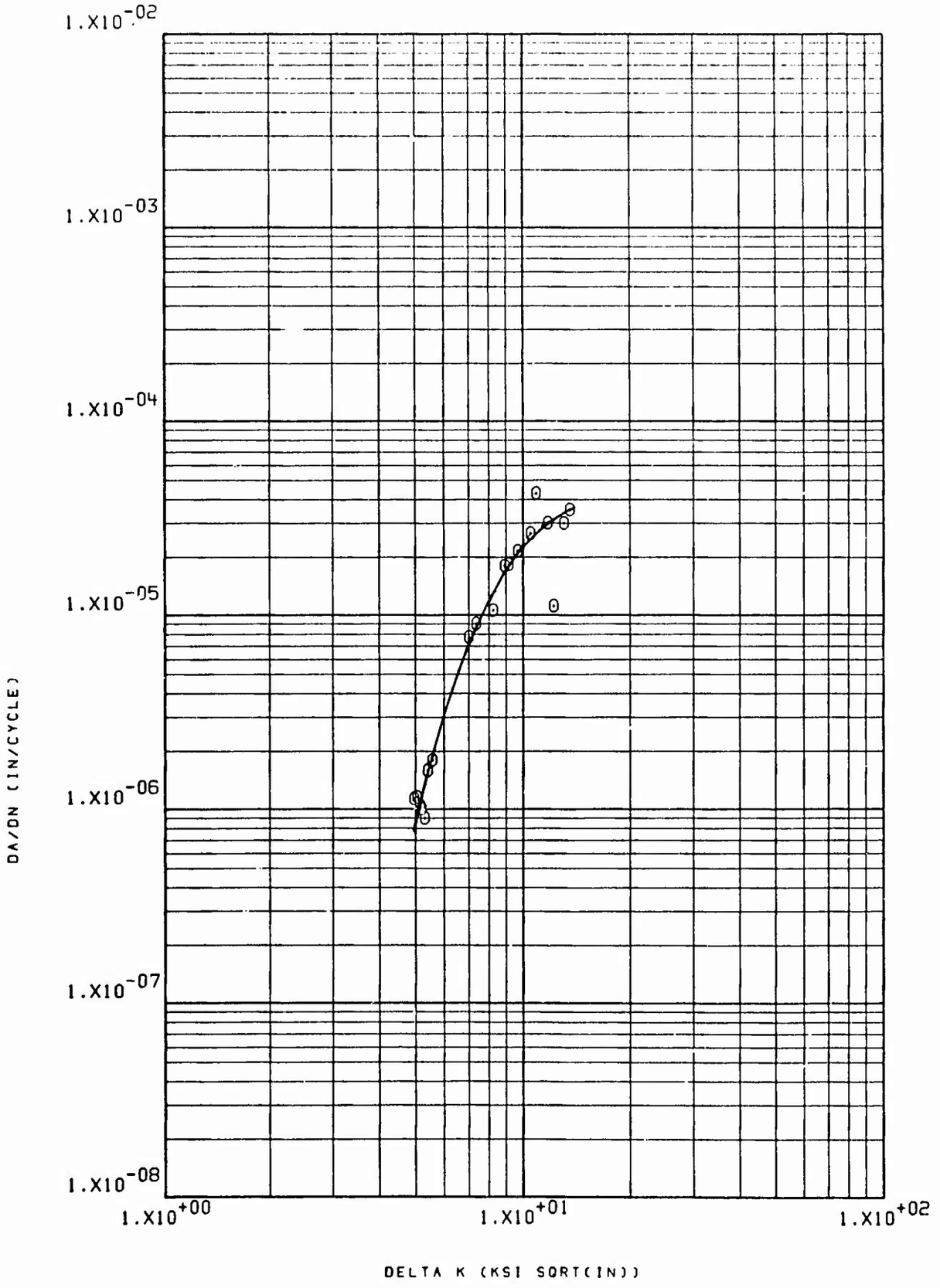
39 NTR 55-34 300M HT STW RT R=.08 60CPM



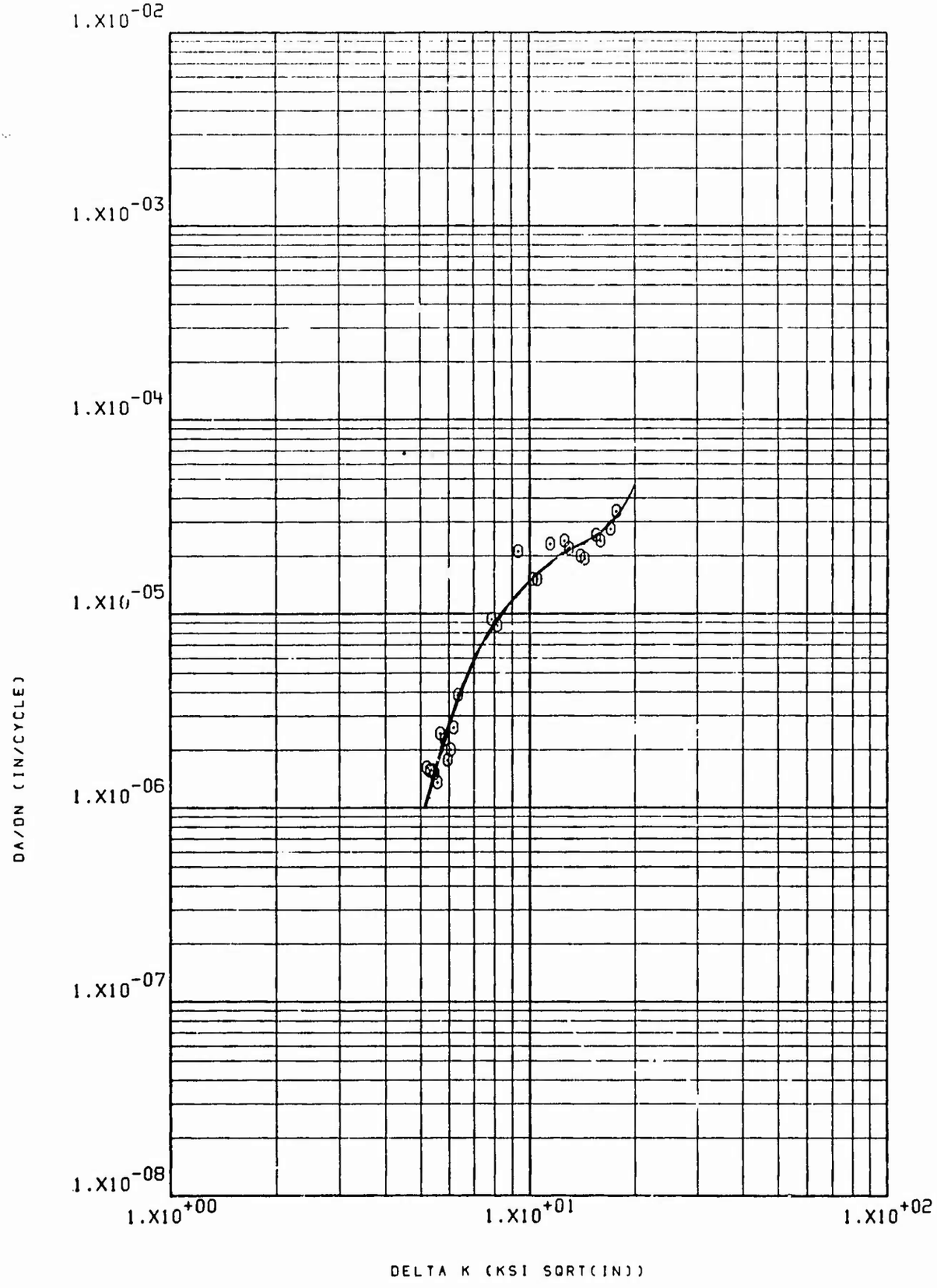
39 NTR 55-35 300M HT LHA -65 R=.08 360CPM



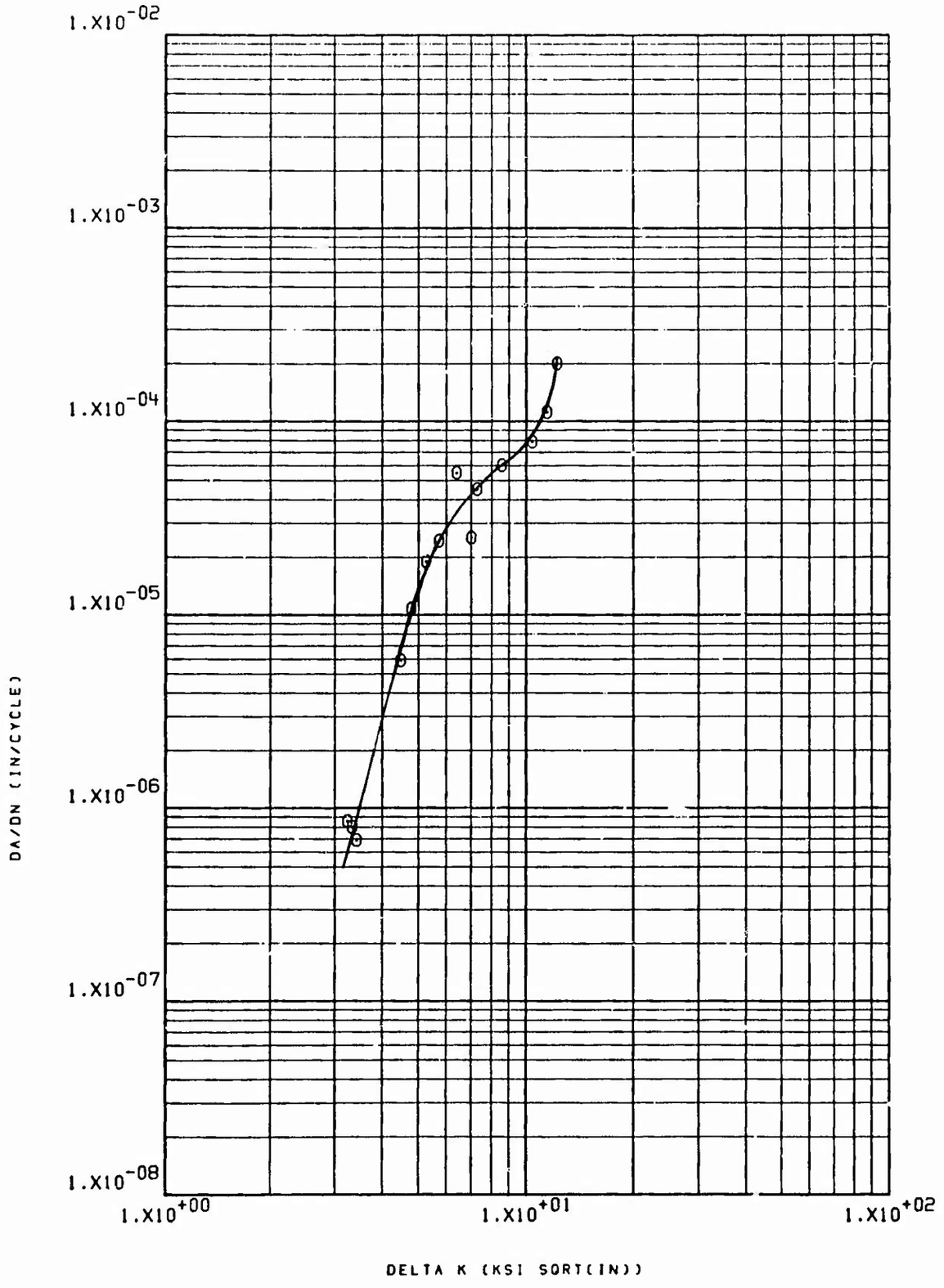
39 NTR 55-36 300M HT LHA RT R=.08 360CPM



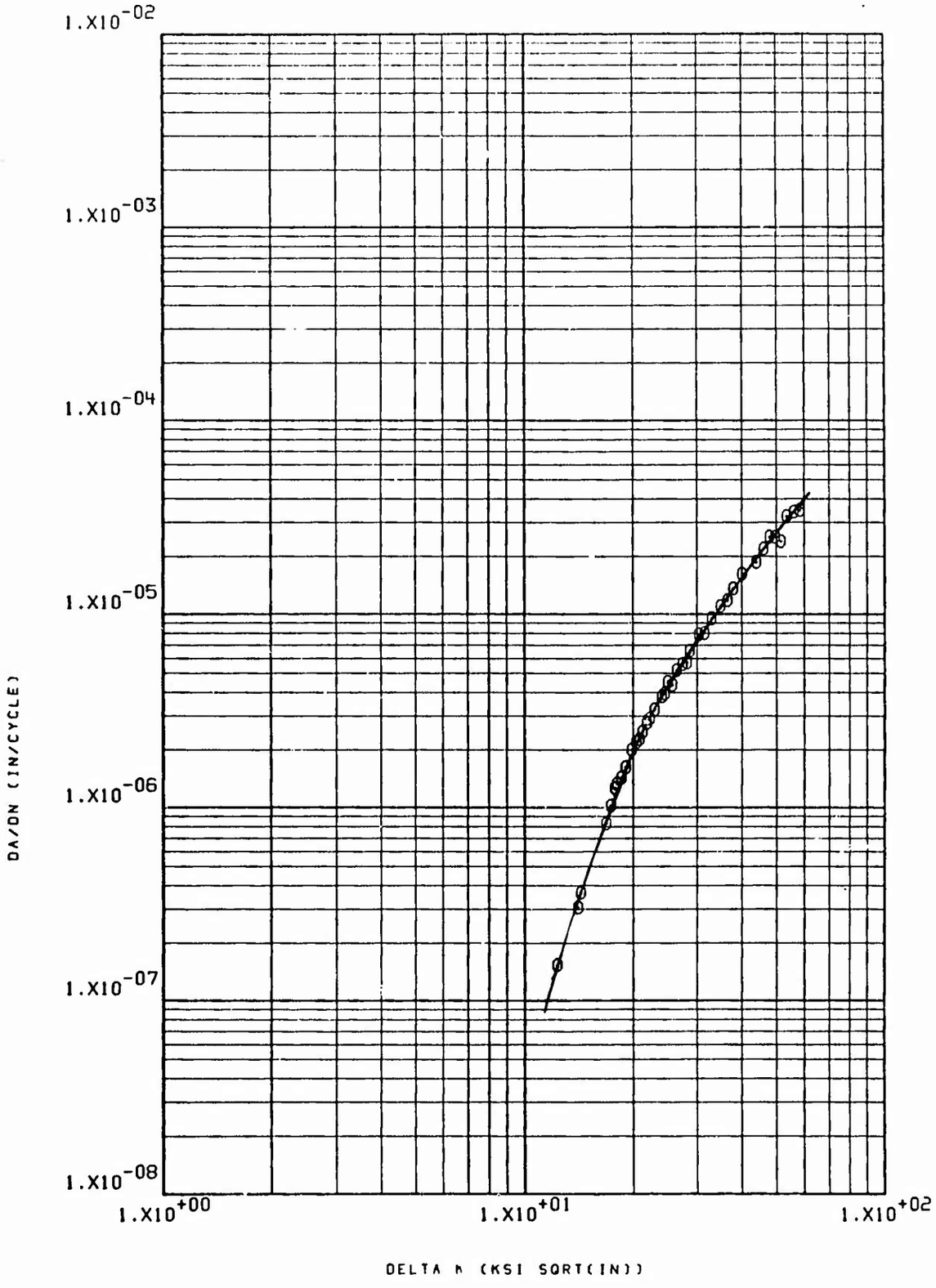
39 NRW 55-70 300M HT SUMP RT R=0.30 60 CPM



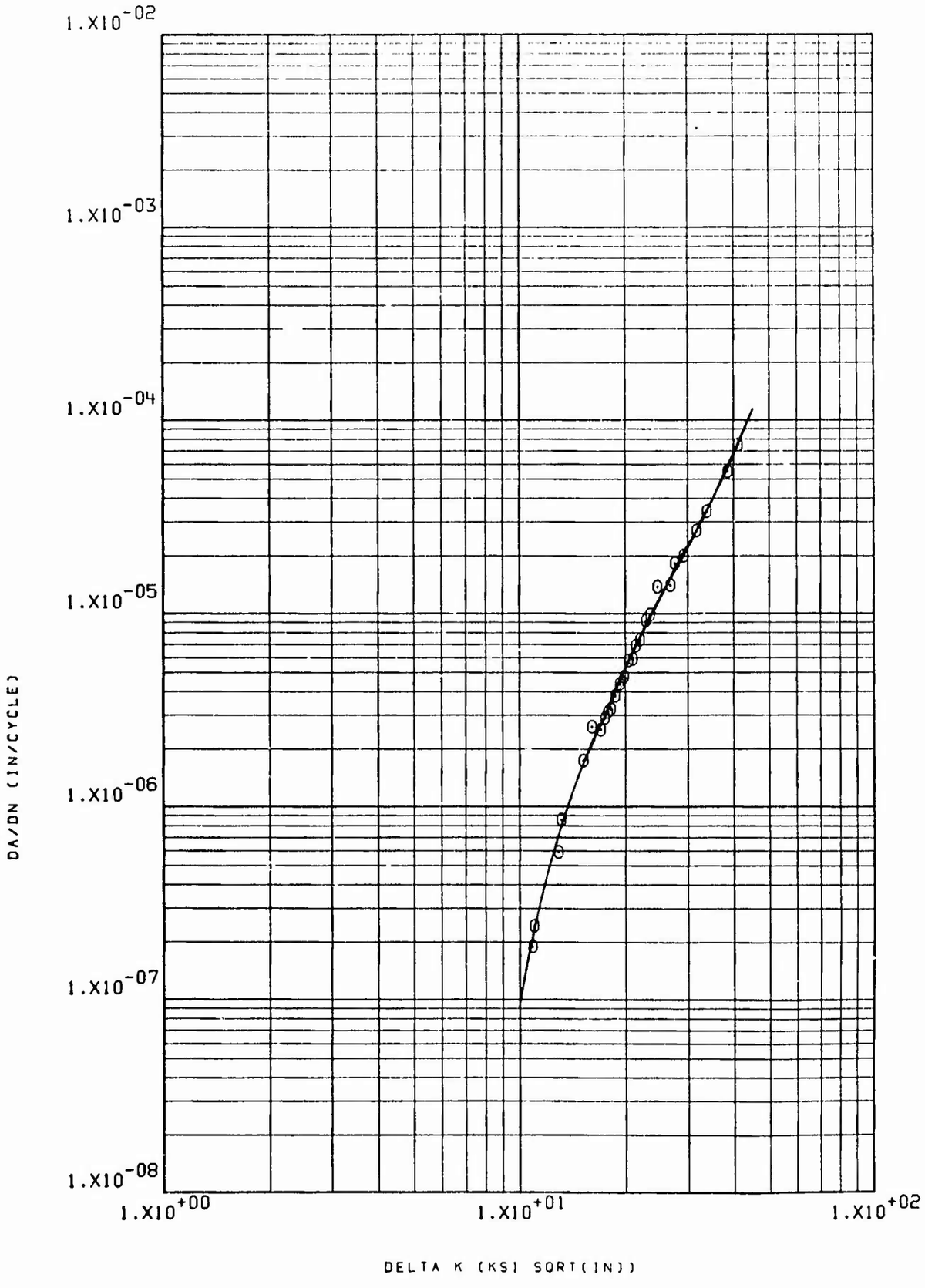
39 NRW 55-71 300M HT SUMP RT R=0.08 60 CPM



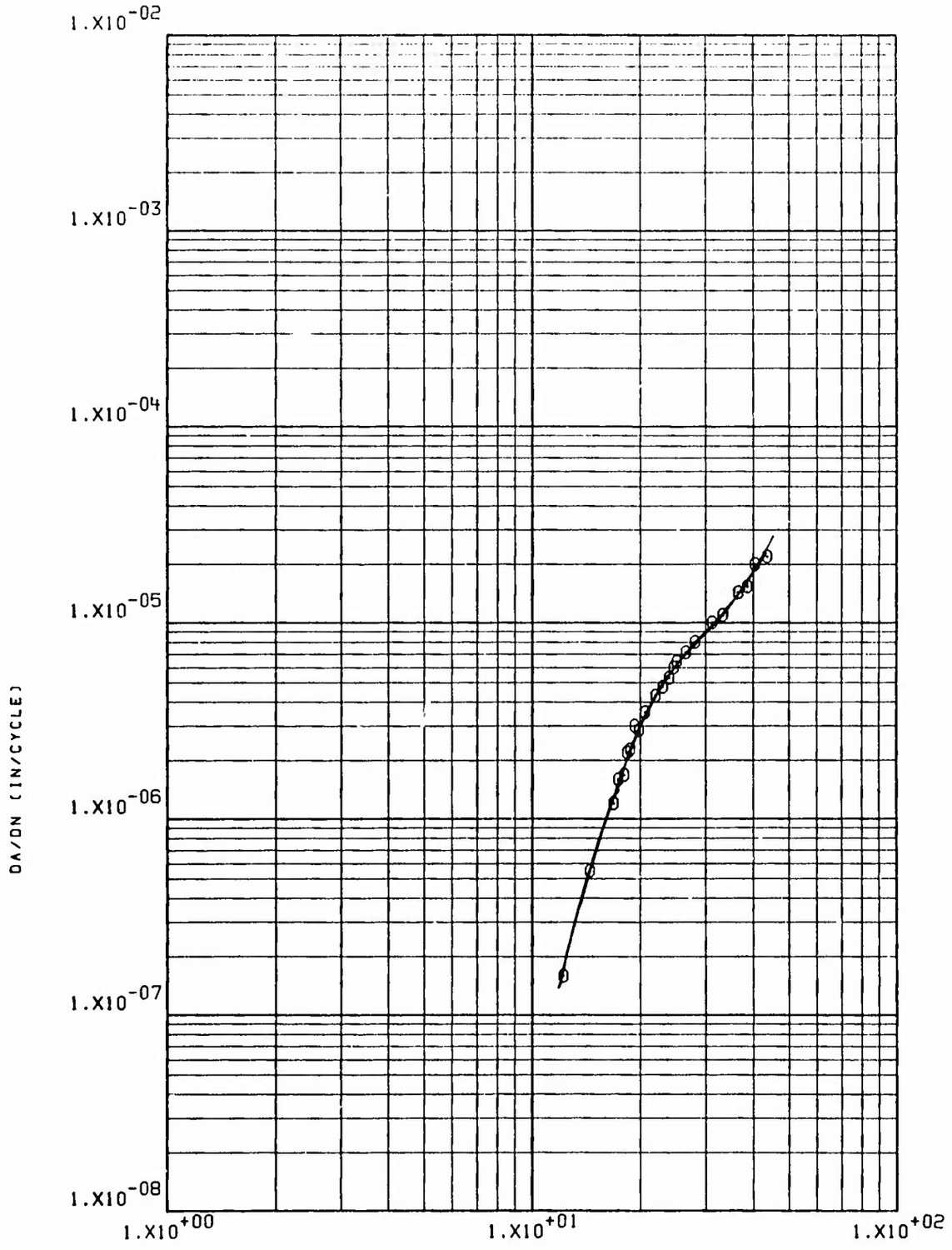
39 NRW 55-72 300M HT SUMP RT R= 0.5 60 CPM



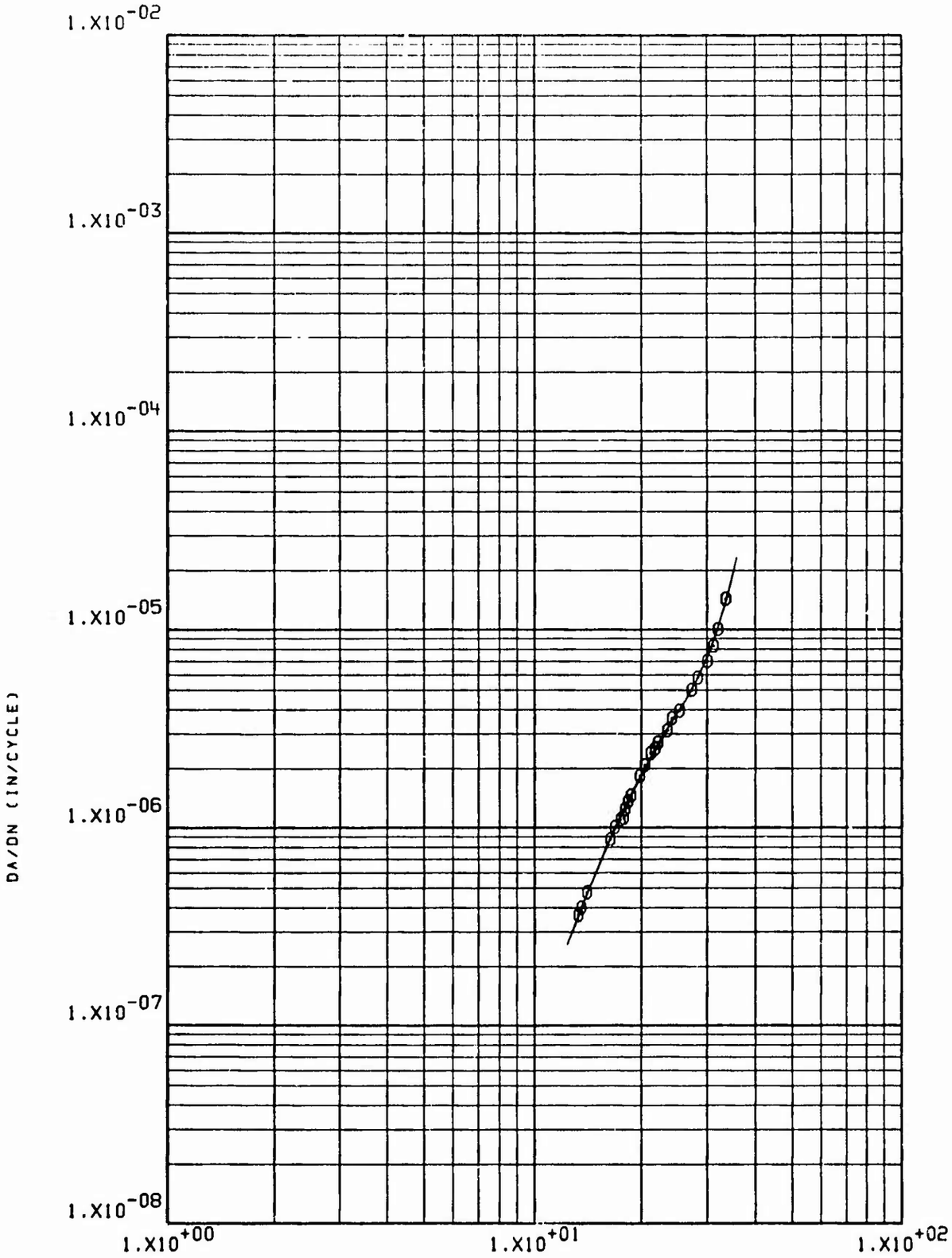
40 NWR 56-1 PH13-8 H1000 ROLL BAR 360CPM LHA RT R=.08



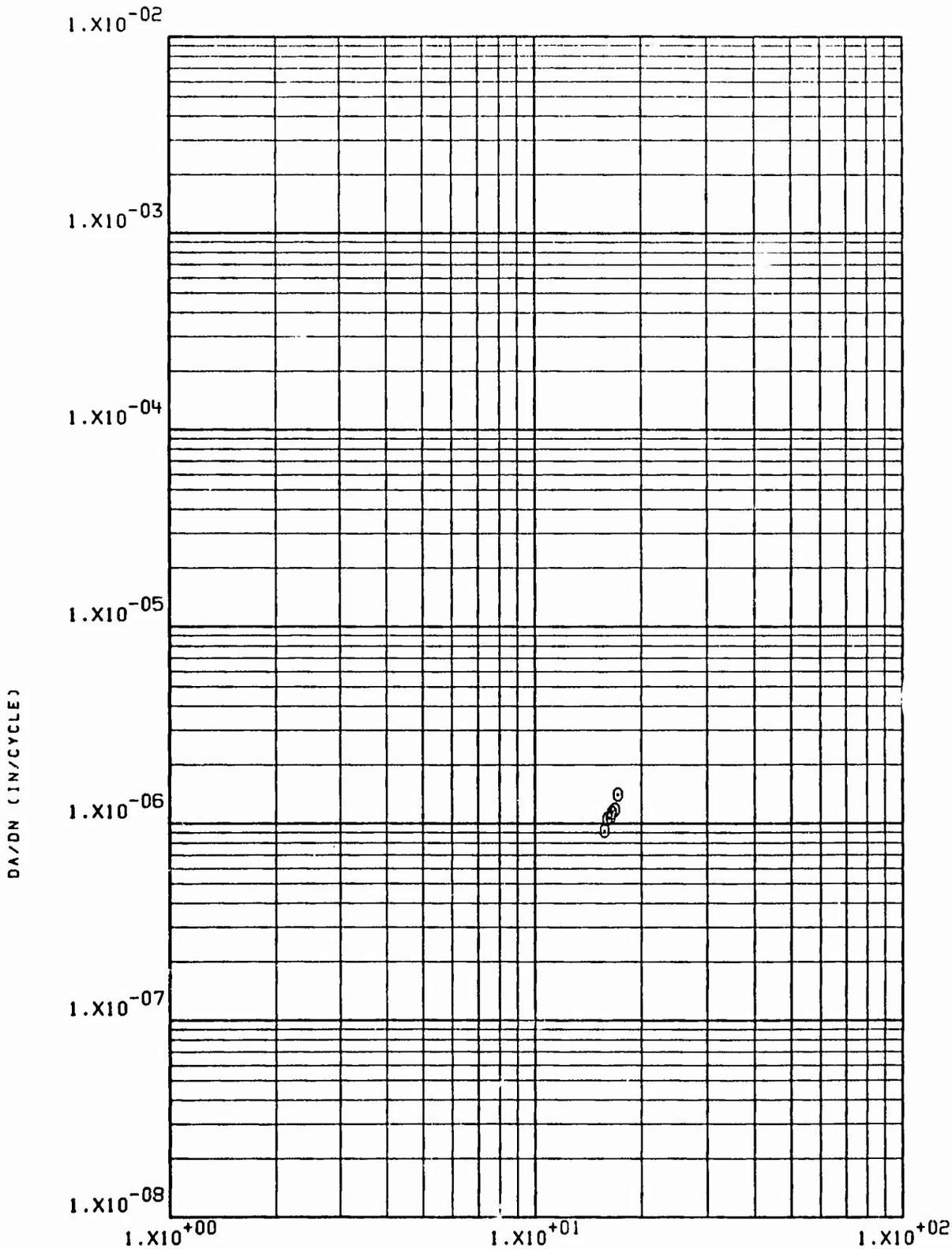
40 NWR 56-2 PH13-8 ROLL BAR H1000 SUMP RT 60CPM R=.08



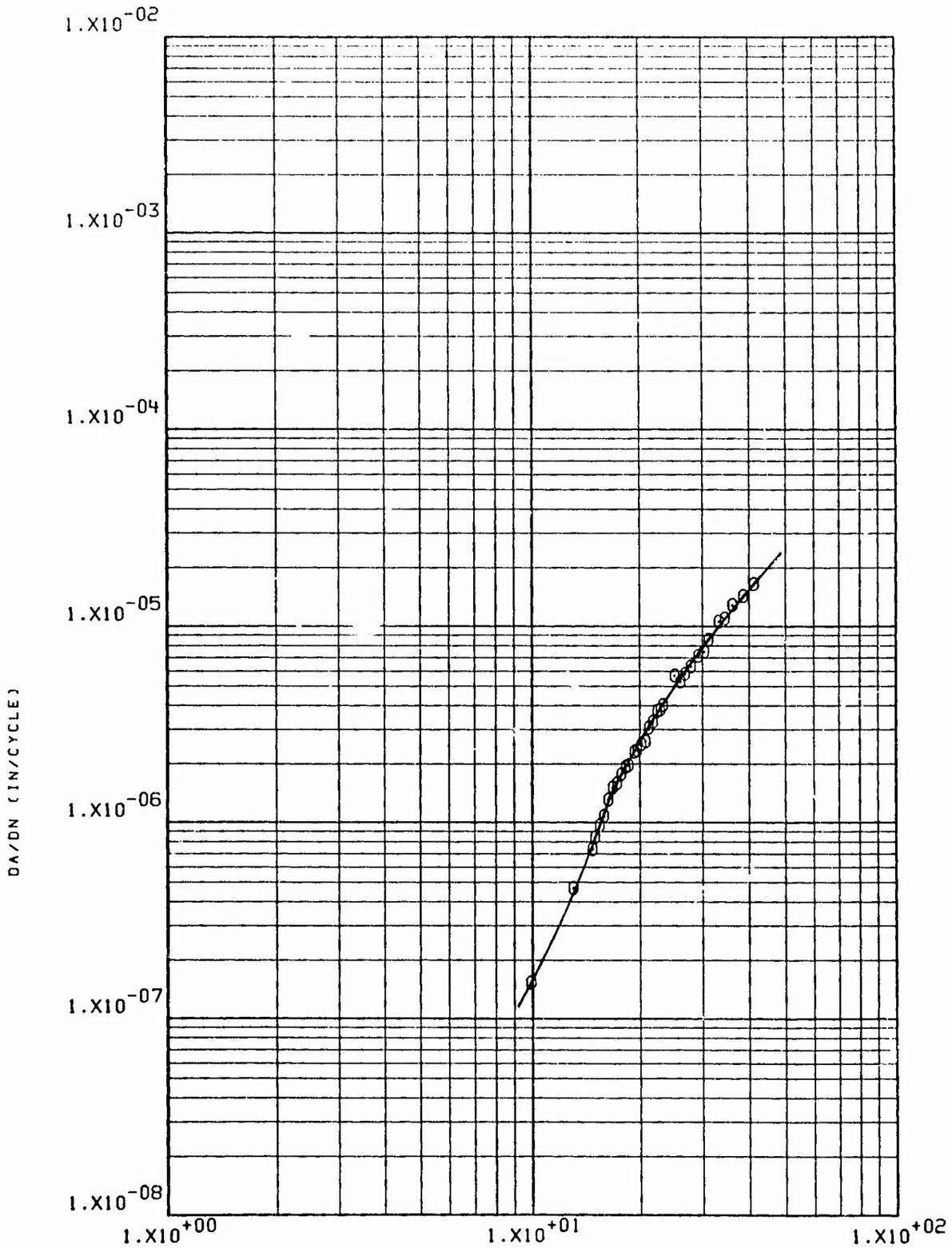
40 NWR 56-3 PH13-8 H1000 L.H.A. R.T.360CPM R=.08



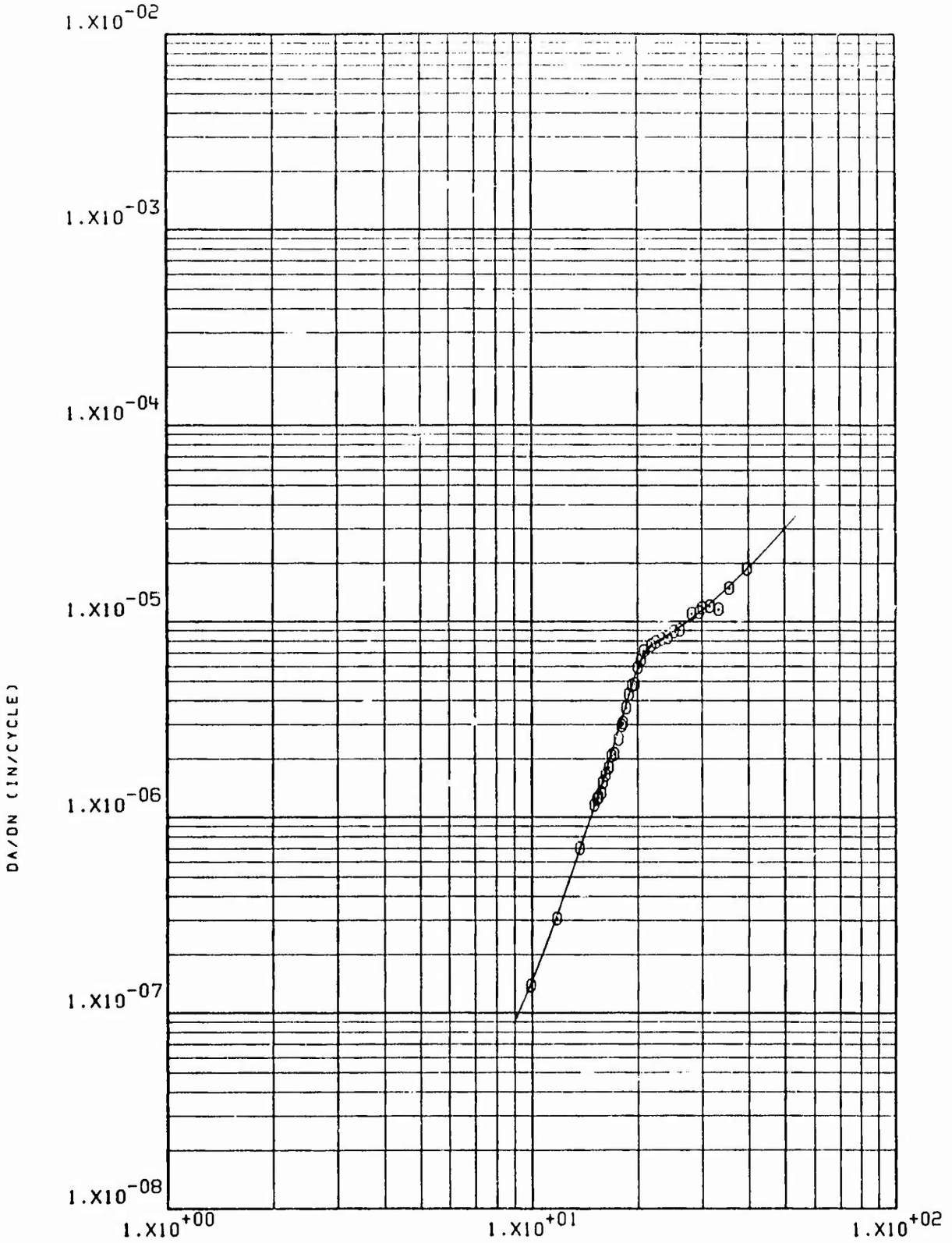
40 NWR 56-4 PH13-8 H1000 L.H.A. -65F 360CPM R=.08



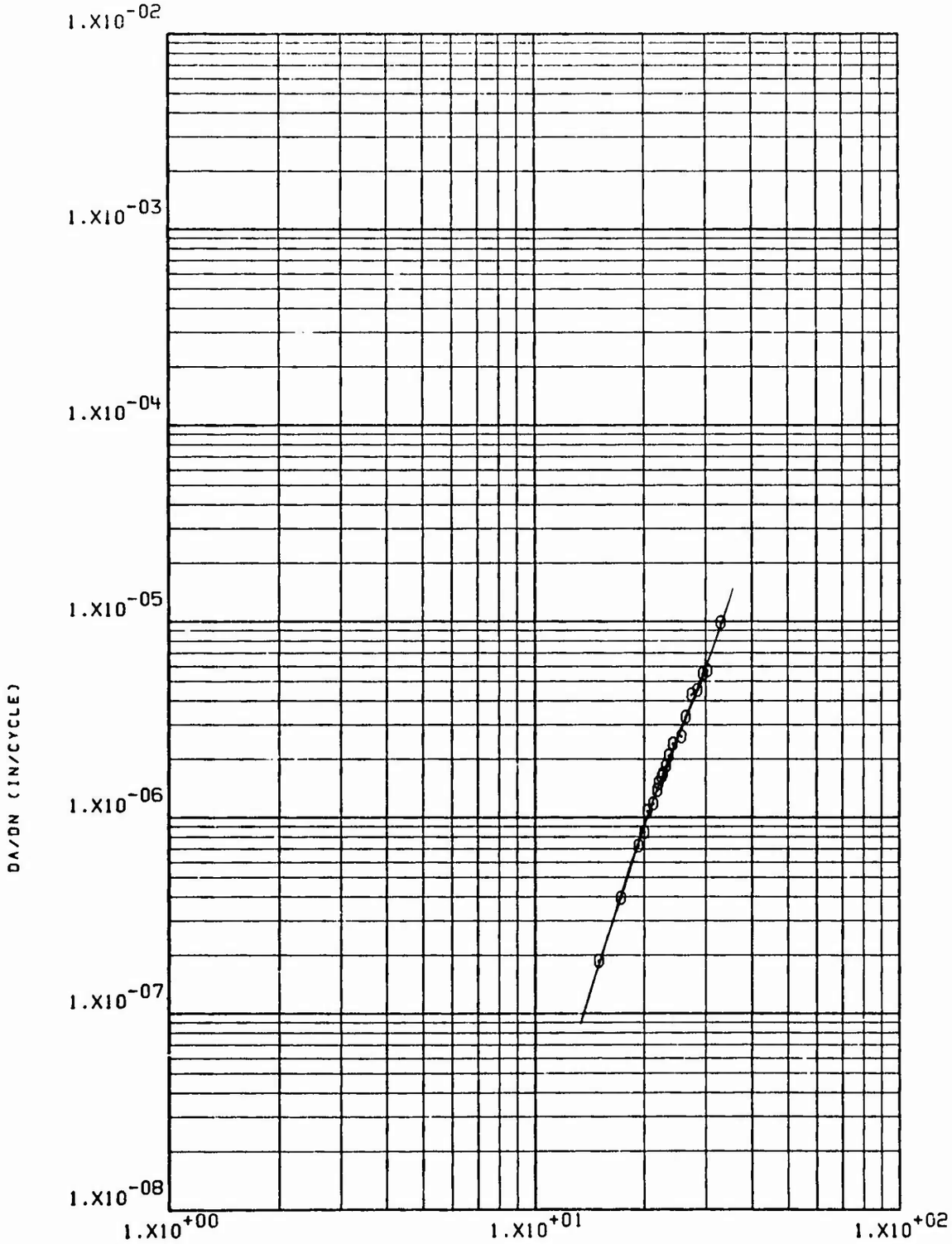
40 NRW 56-5 PH 13-8 LHA RT 6CPM R=.08 (H1000)



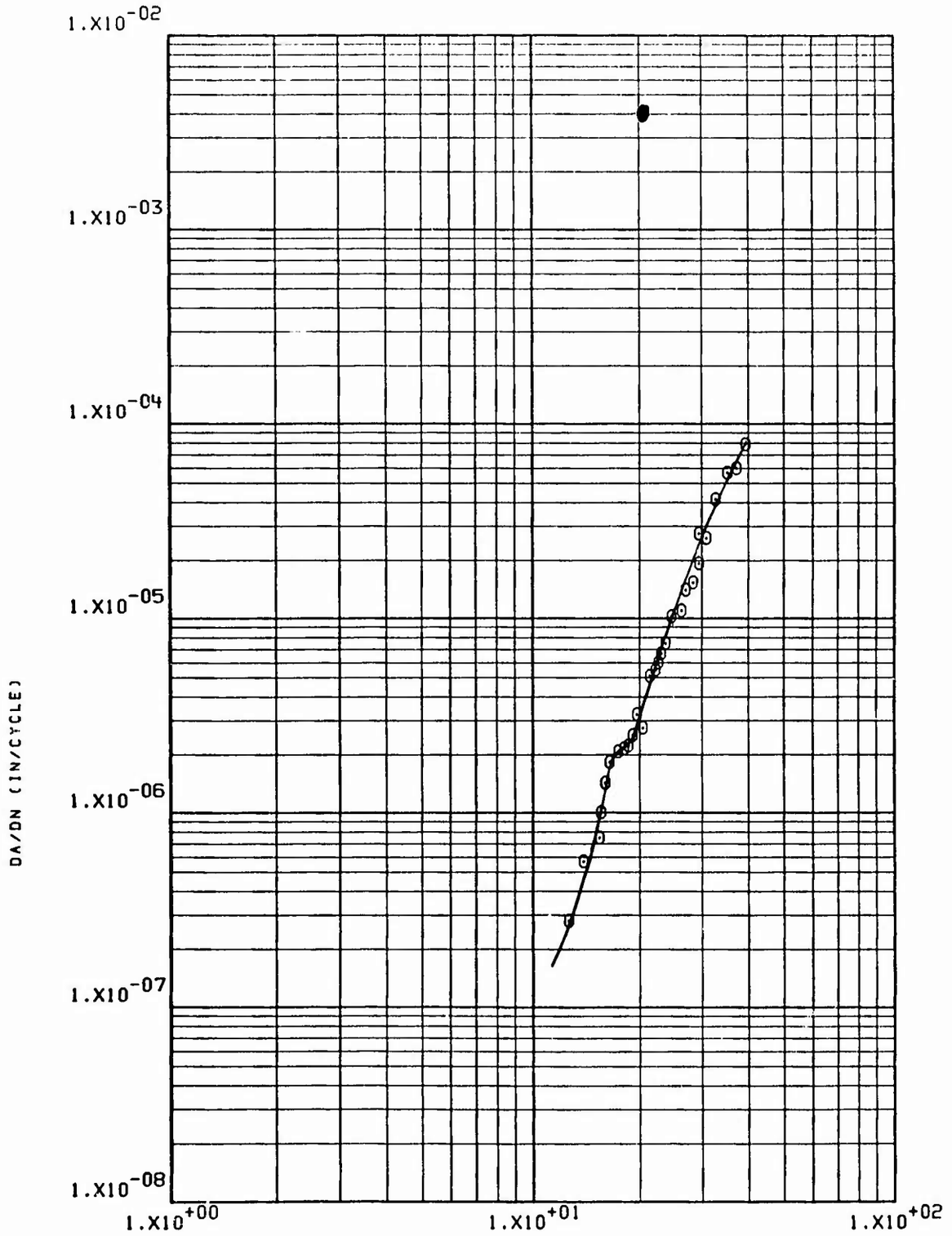
40 NRW 56-6 PH13-8 ROLL BAR H-1000 LHA RT 60CPM R=.08



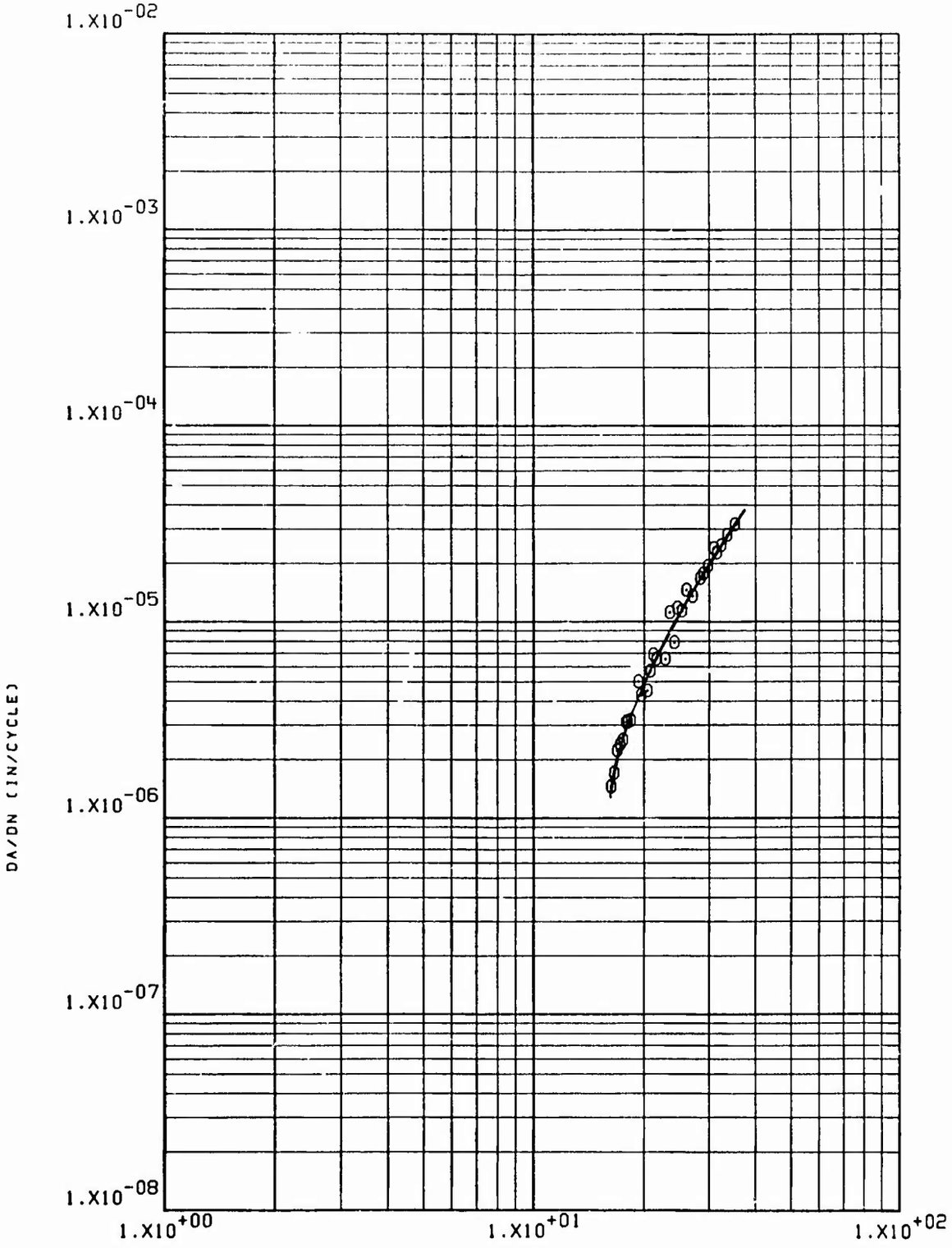
40 NRW 56-7 PH13-8 ROLL BAR H-1000 LHA RT R=.08 360CPM



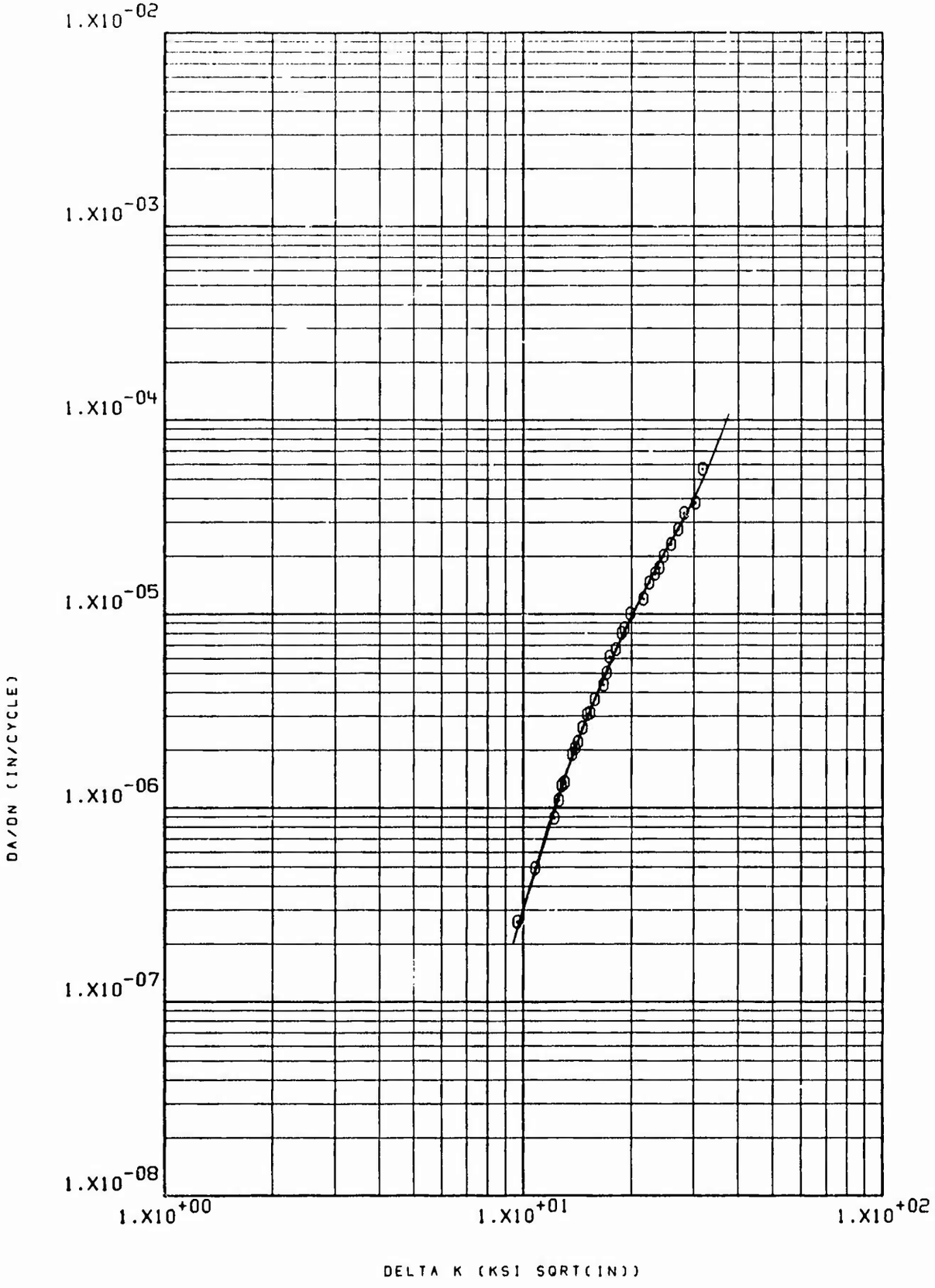
40 NRW 56-8 PH 13-8 ROLL BAR H-1000 LHA 360CPM -65F R=.08



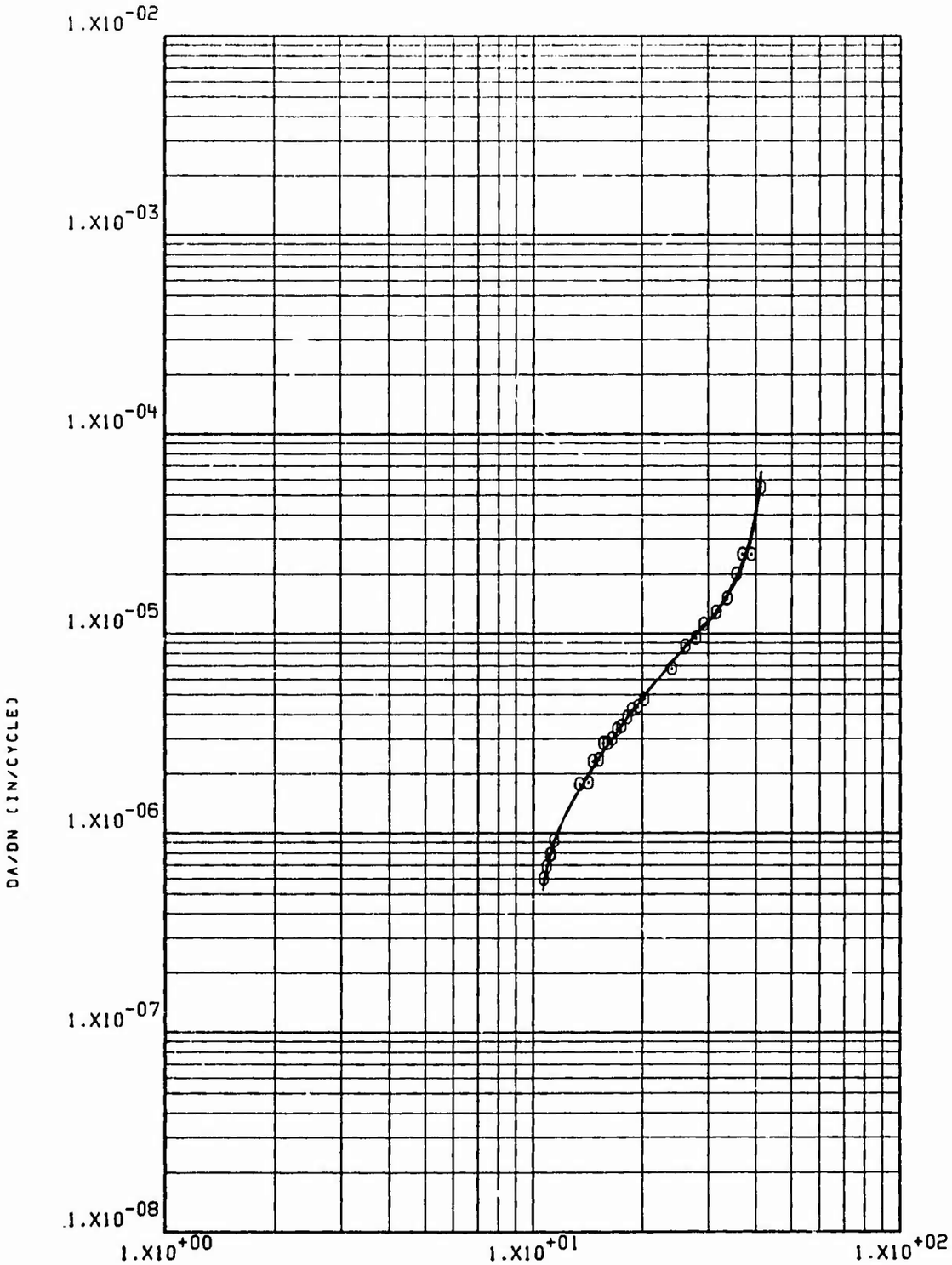
40NRW56-9 PH13-8 H-1000 SUMP 60CPM RT R=.08



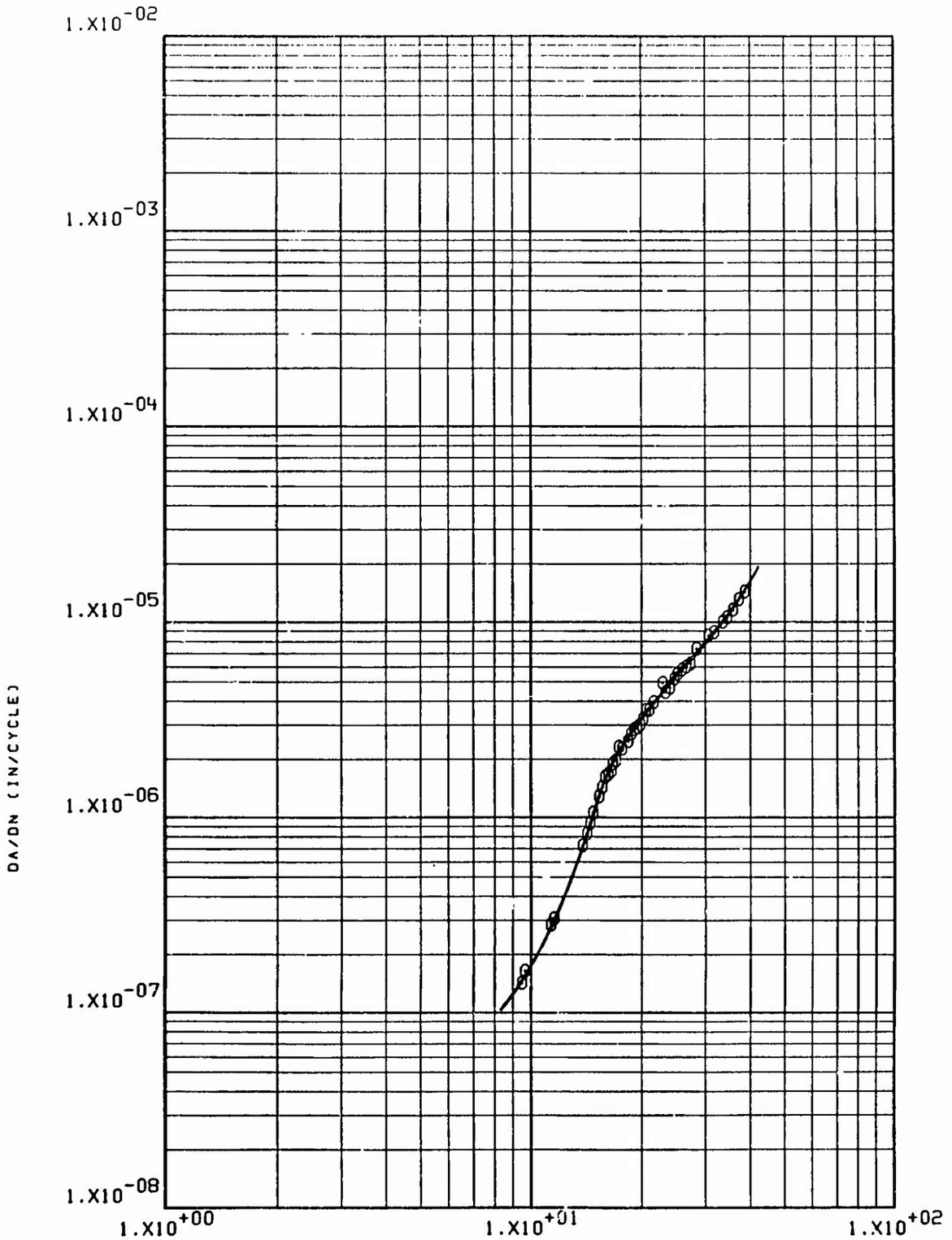
40 NRW 56-10 PH13-8MO (H1000) STW RT R=.08 6 CPM



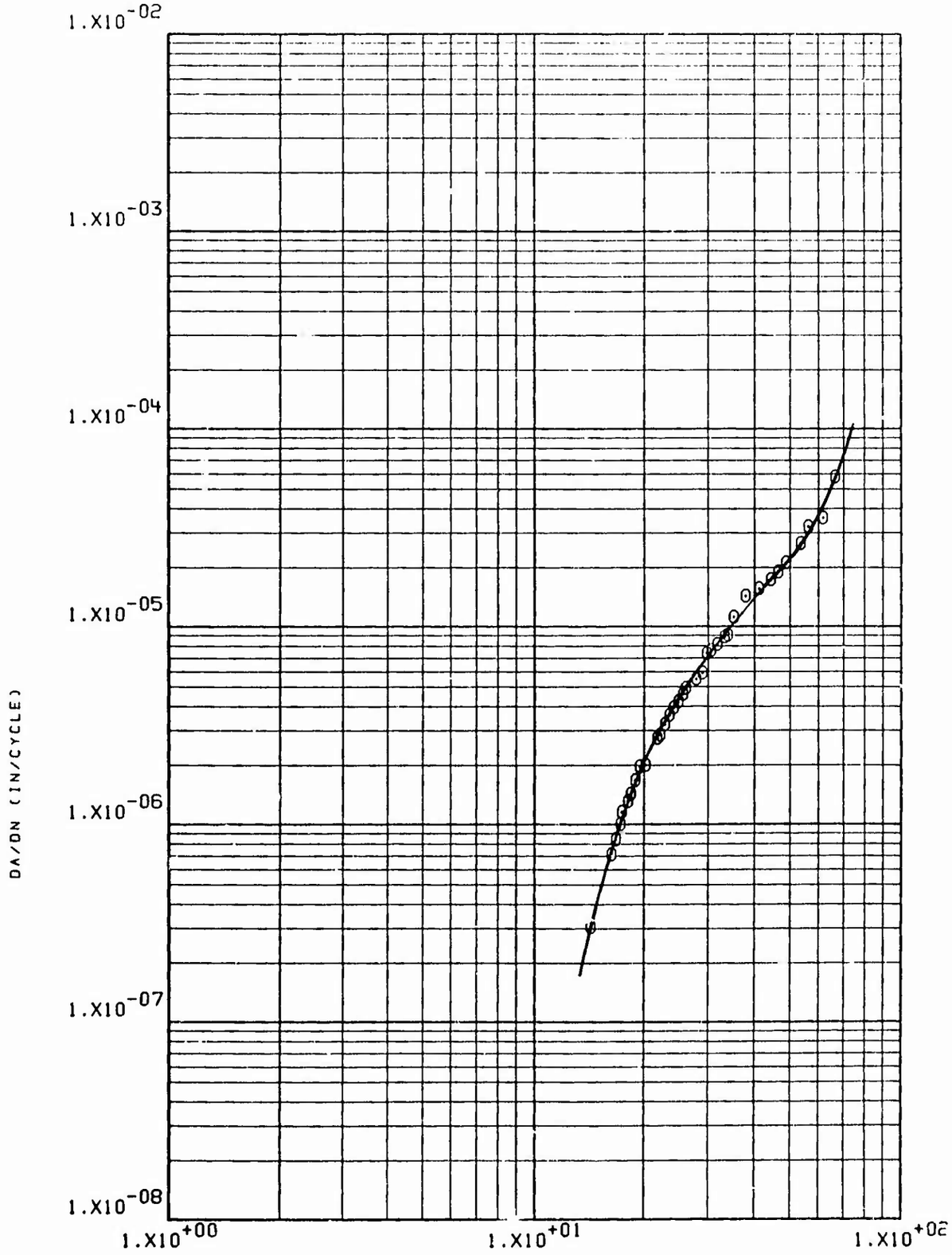
40 NRW 56-11 PH13-8 ROLL BAR H-1000 SUMP 60CPM RT R=.3



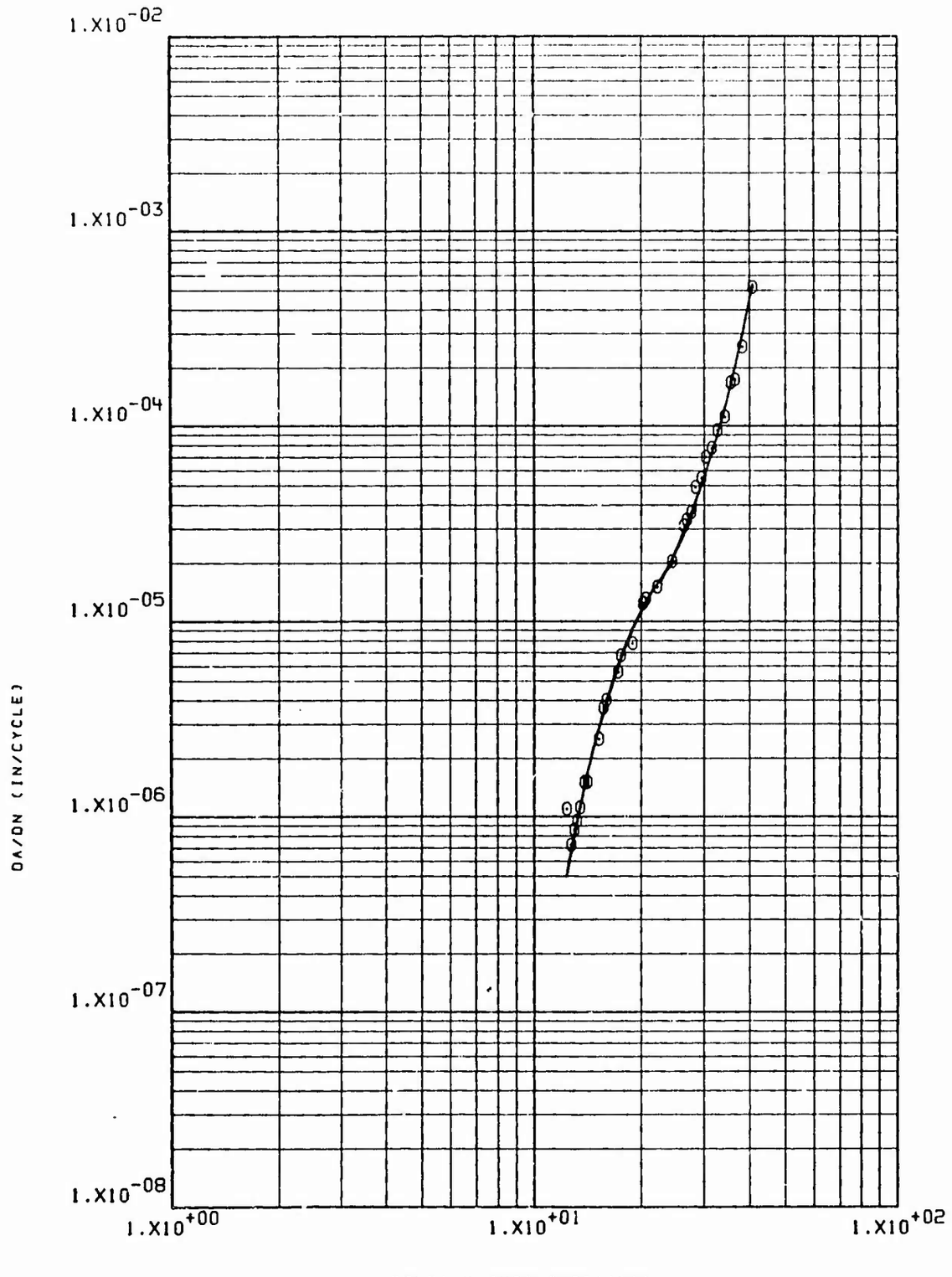
40 NRW 56-12 PH13-8MO H1000 L.H.A. R.T. 360CPM R=.5



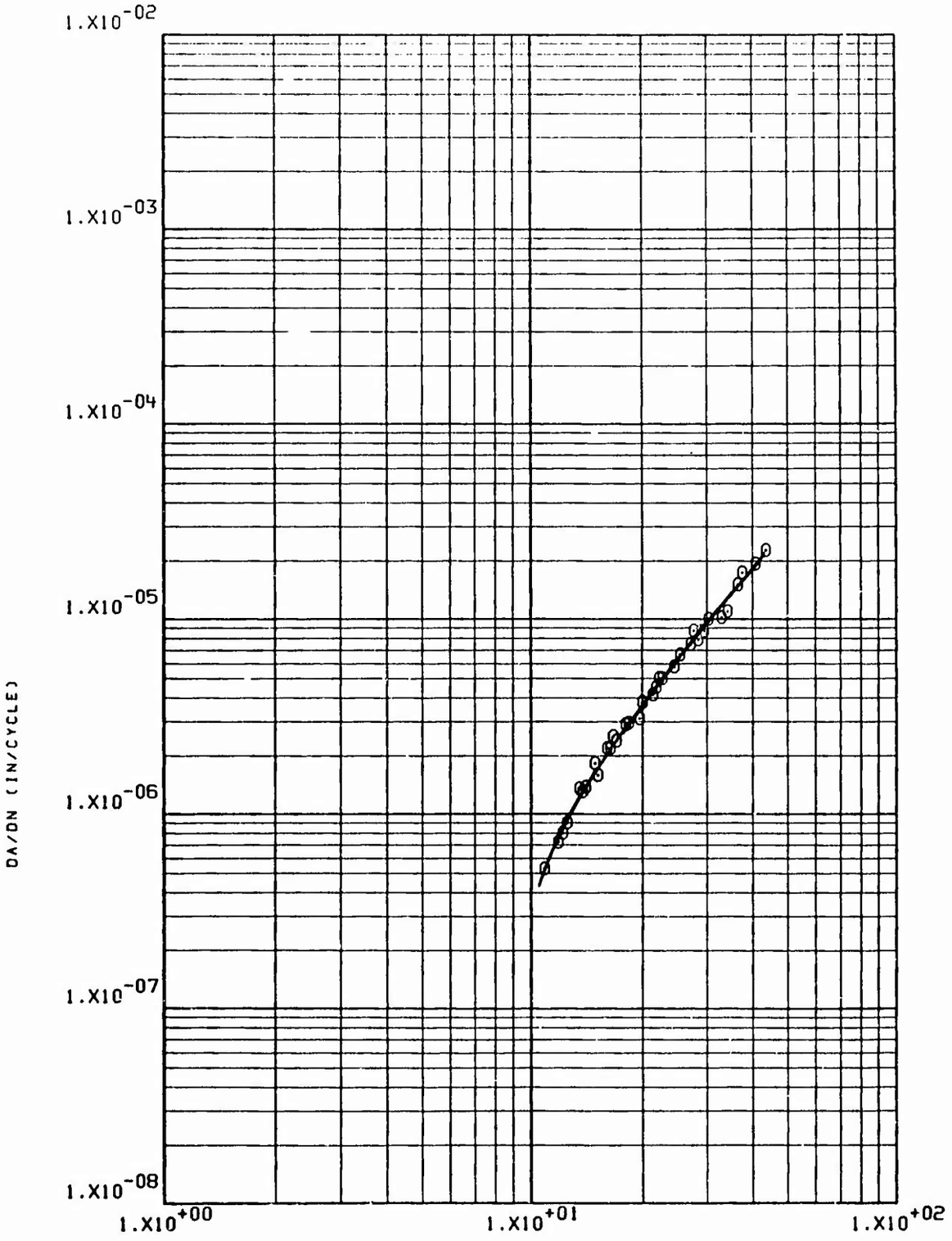
40 NRW 56-13 PH 13-8 MO H1000 LHA RT R=.08 360CPM



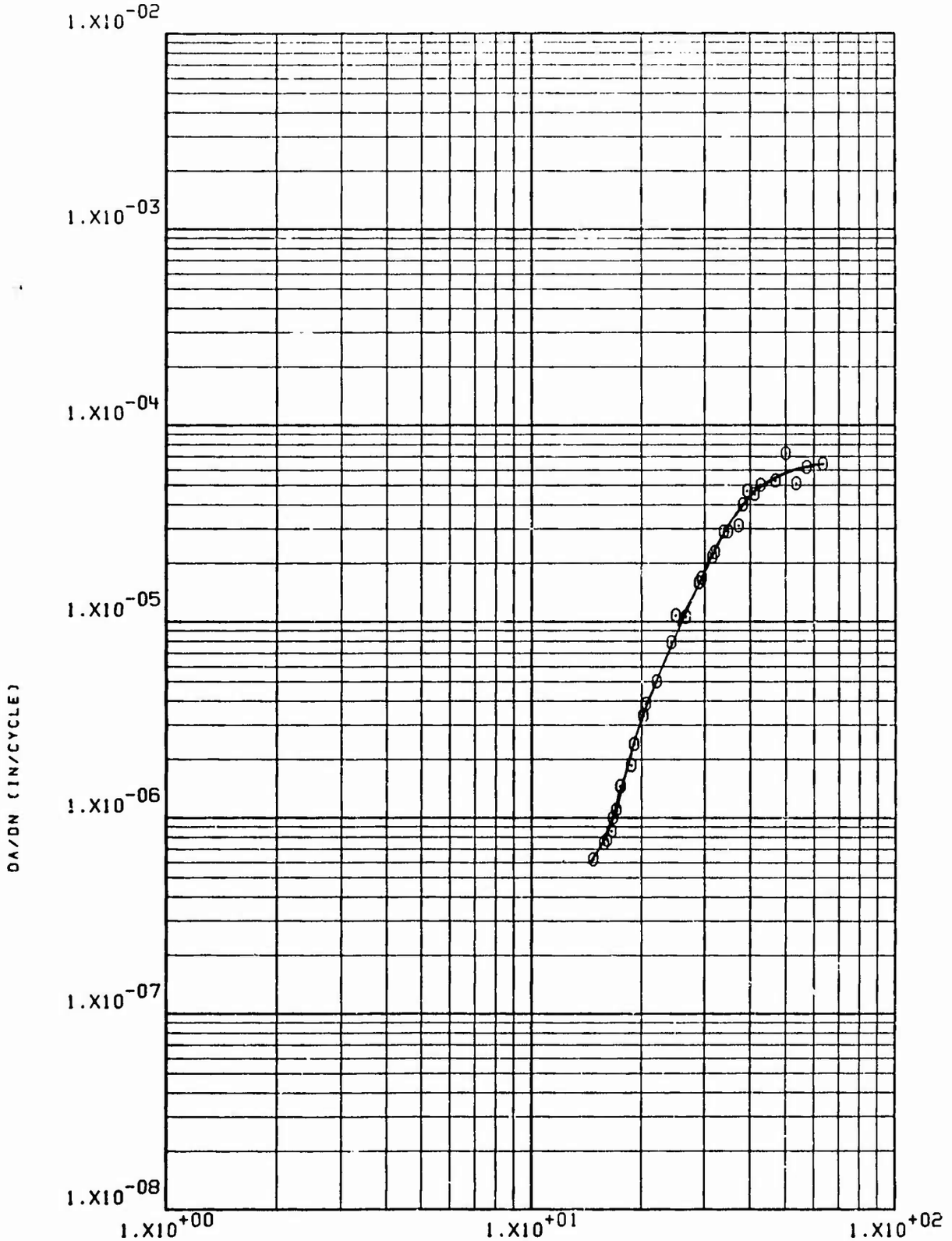
40 NRW 56-14 PH13-8 H-1000 ROLL BAR LHA RT 3600PM R=.08



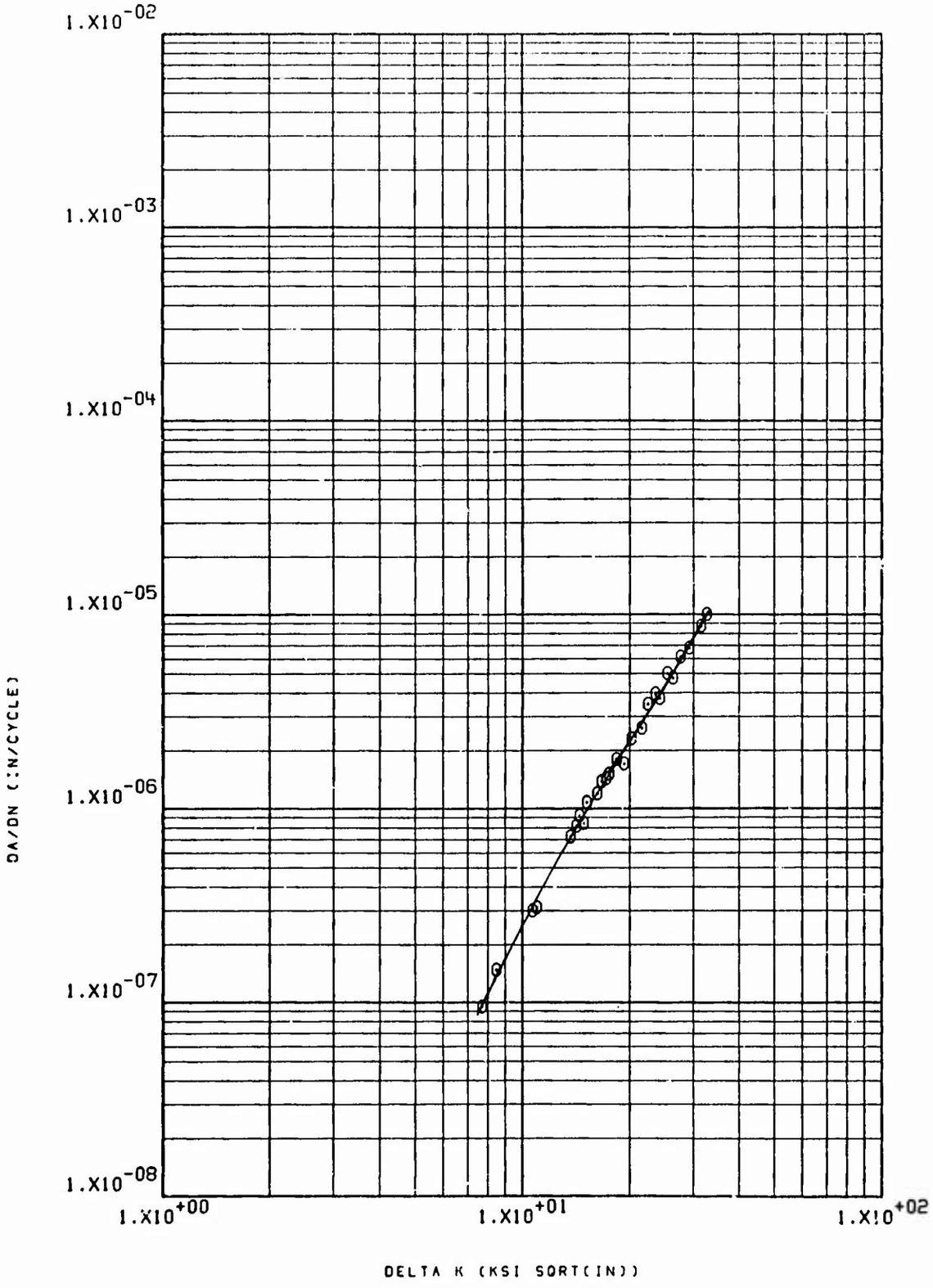
40 NRW 56-15 PH13-8MO H1000 STW RT R=.30 60CPM



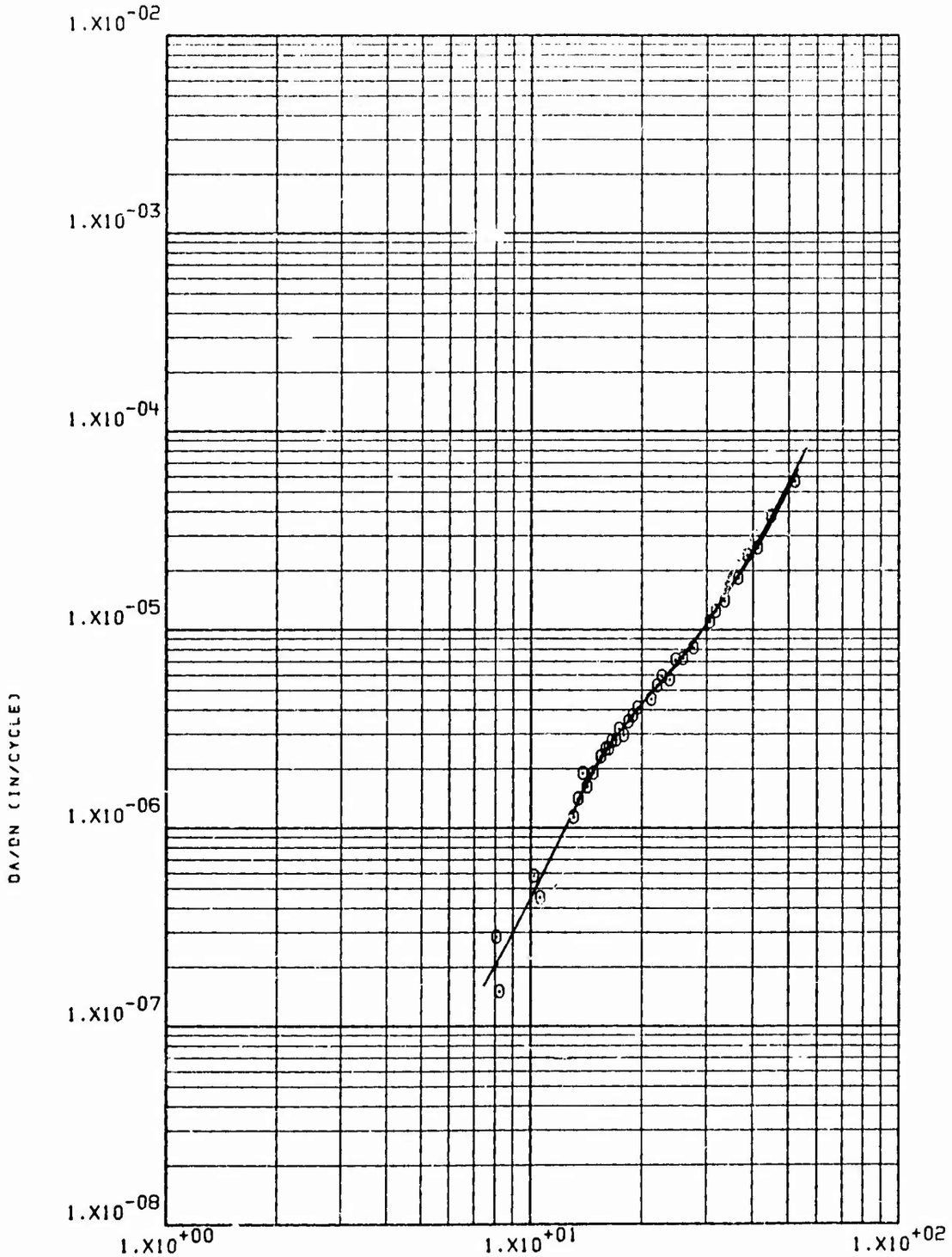
40 NRW 56-16 PH13-8MO H1000 LHA RT R=.30 360CPM



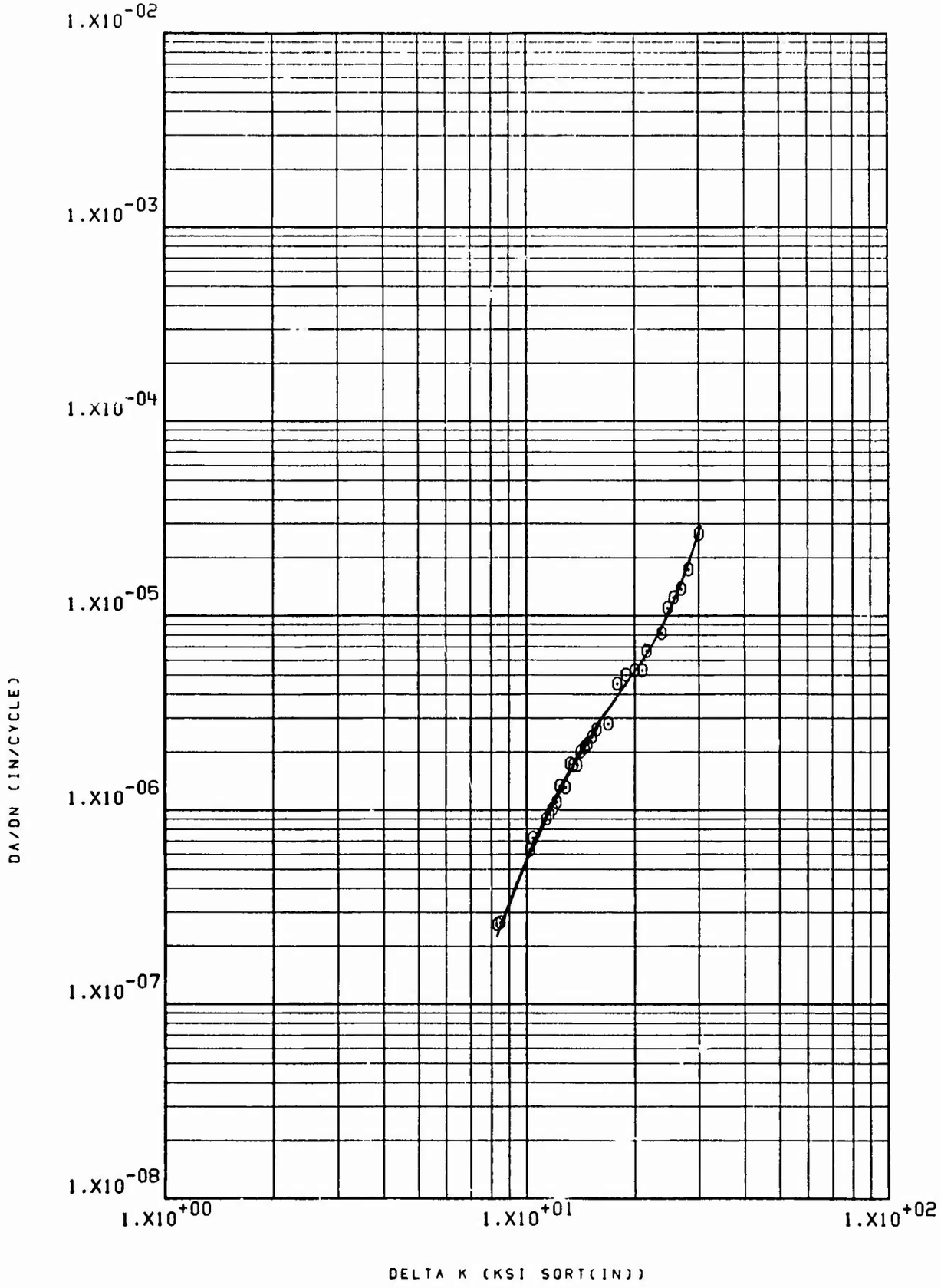
40 NRW 56-17 PH13-8MO H1000 SCS RT R=.08 60CPM



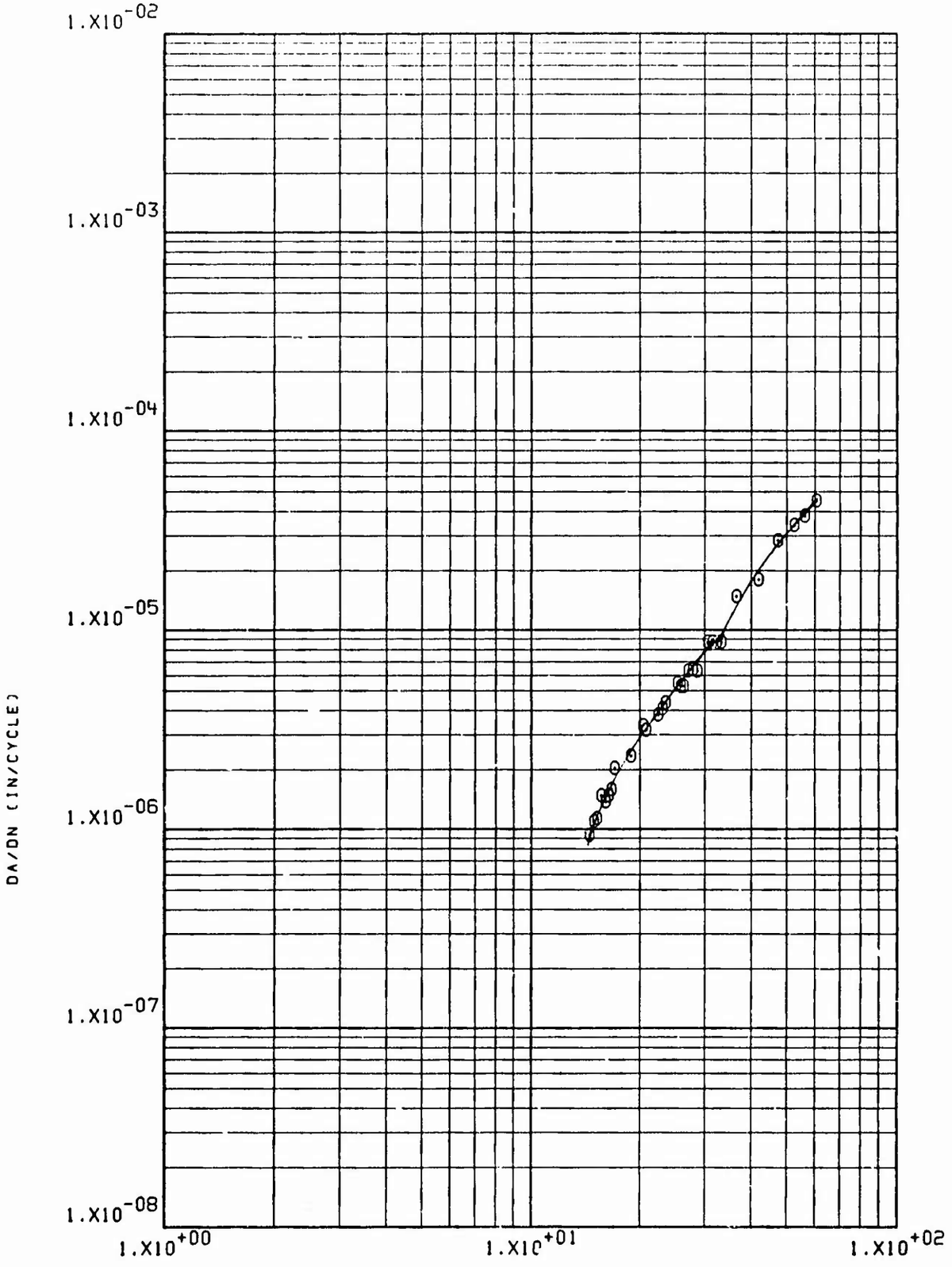
41NRW57-1 PH13-8 H-1000 LHA -65 F 360CPM R=.08



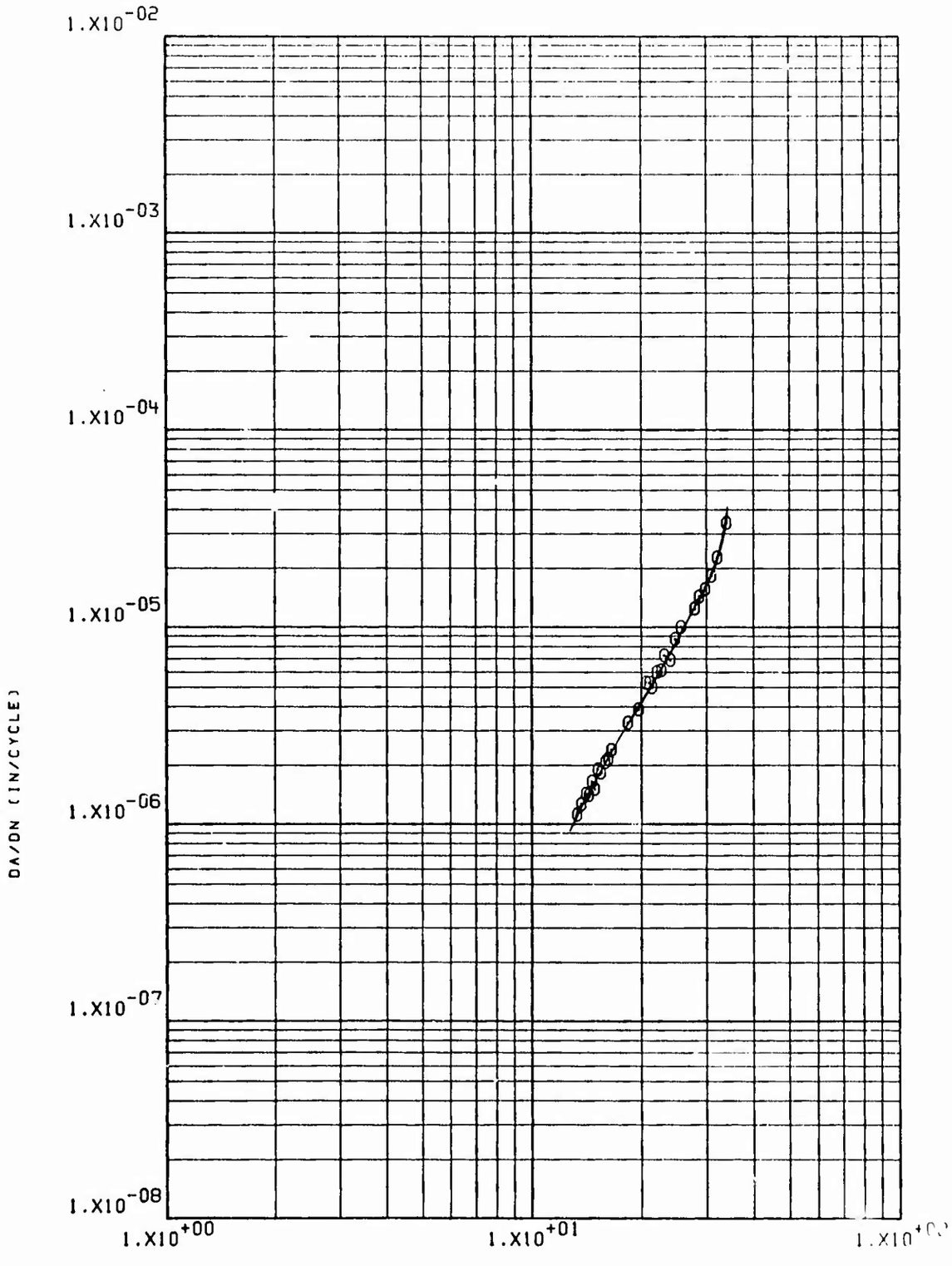
41 NRW 57-2 PH13-8MO (H1000) LHA RT R=.08 360CPM



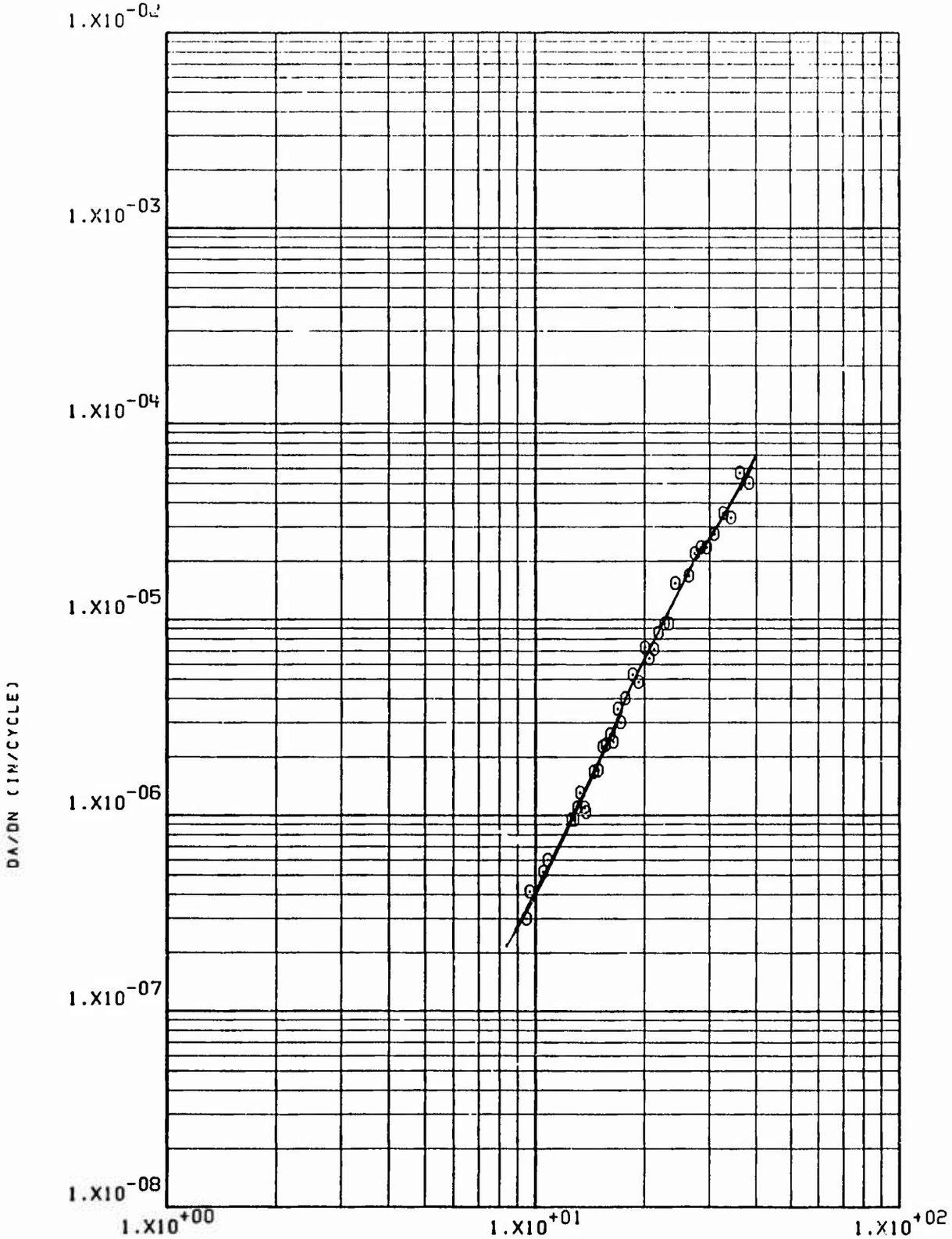
41 NRW 57-4 PH 13-8 H1000 LHA RT R=.5 360CPM



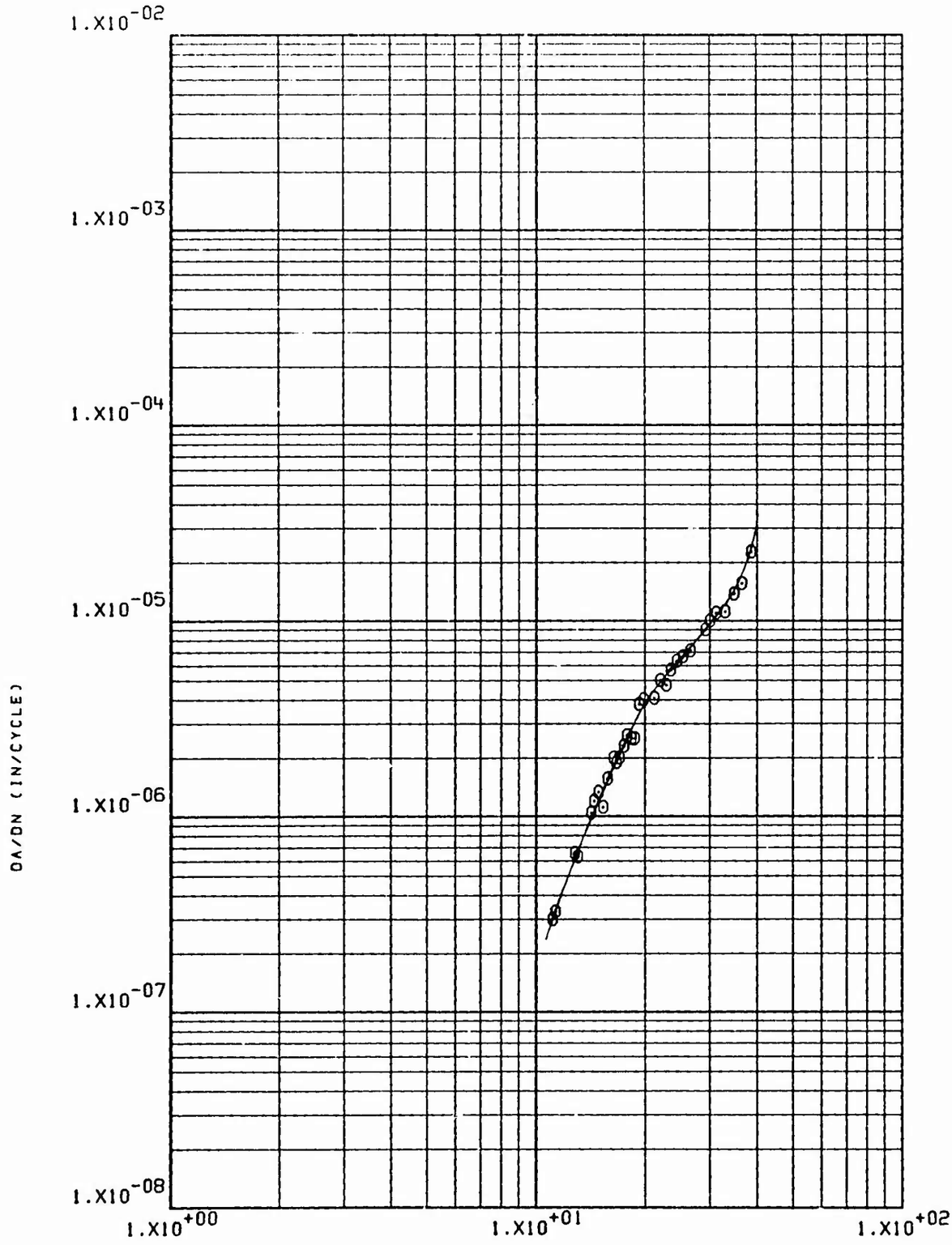
41 NRW 57-8 PH13-8MO H1000 LHA RT R=.08 360CPM



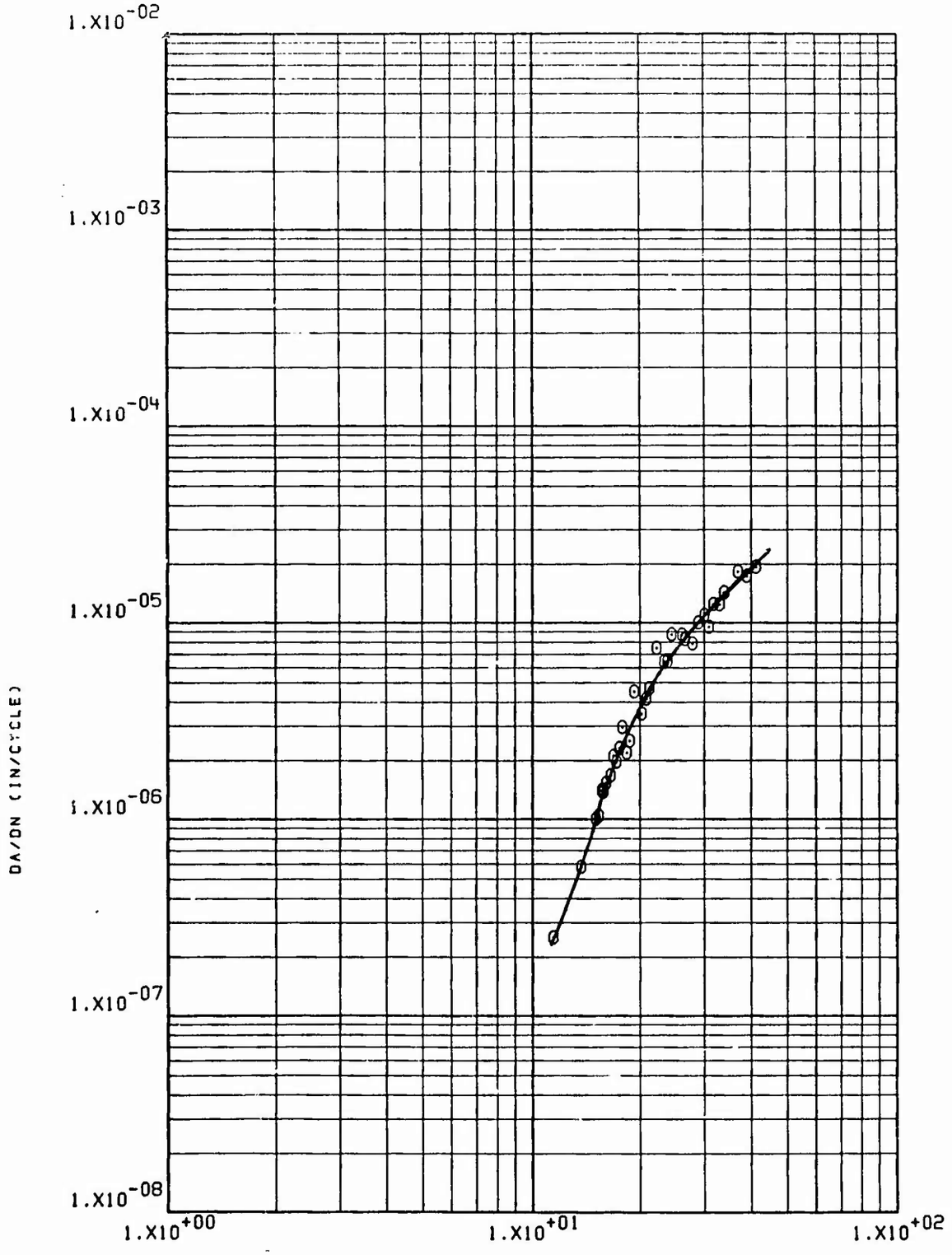
41 NRW 57-11 PH13-8MO H1000 LHA RT R=.50 360CPM



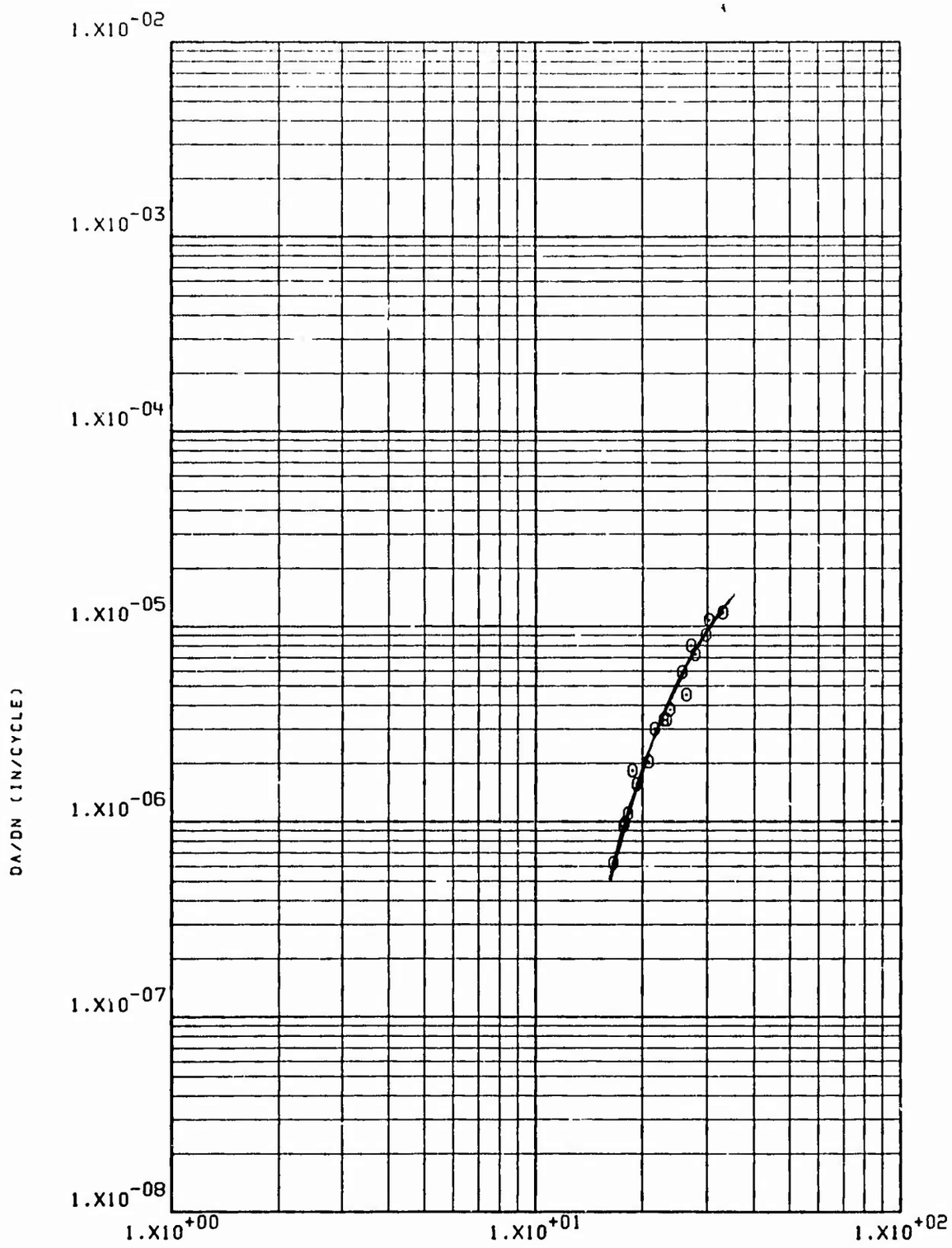
41 NRW 57-13 PH 13-8 H-1000 SUMP RT R=.08 60CPM



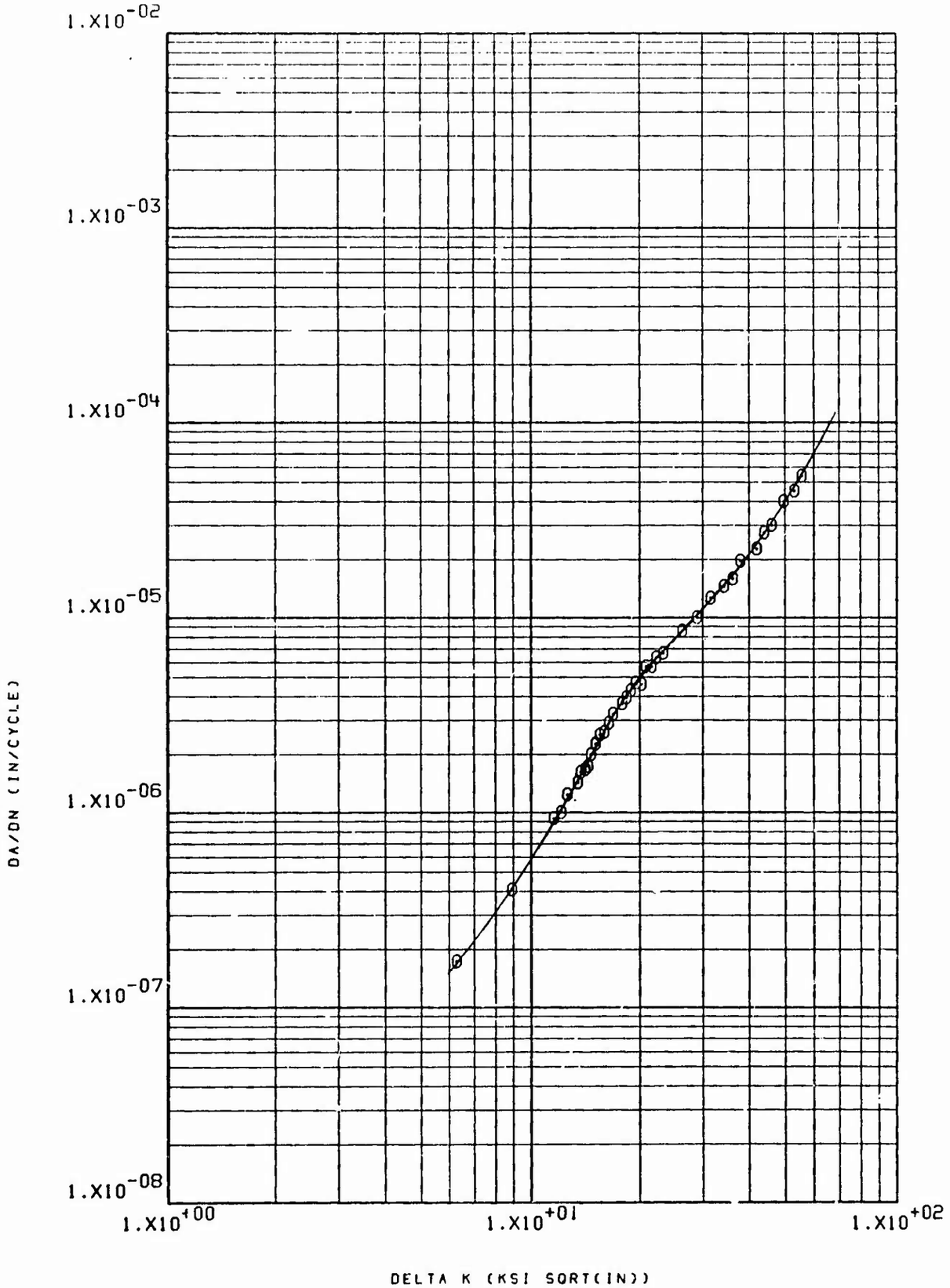
41 NRW 57-14 PH13-8MO H1000 LHA RT R=.08 360CPM



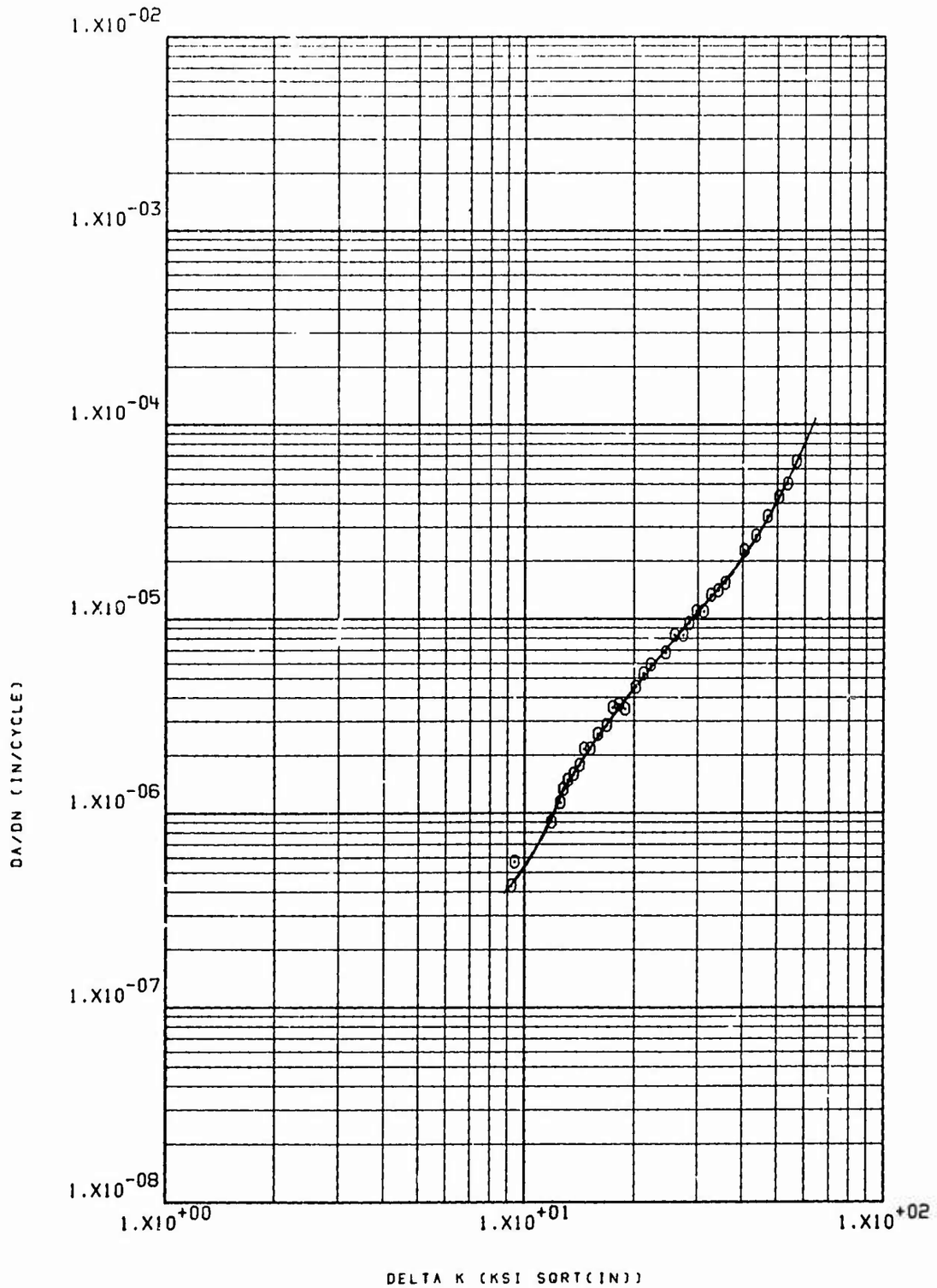
41 NWR 57-16 PH13-8MO H1000 LHA RT R=.08 360CPM



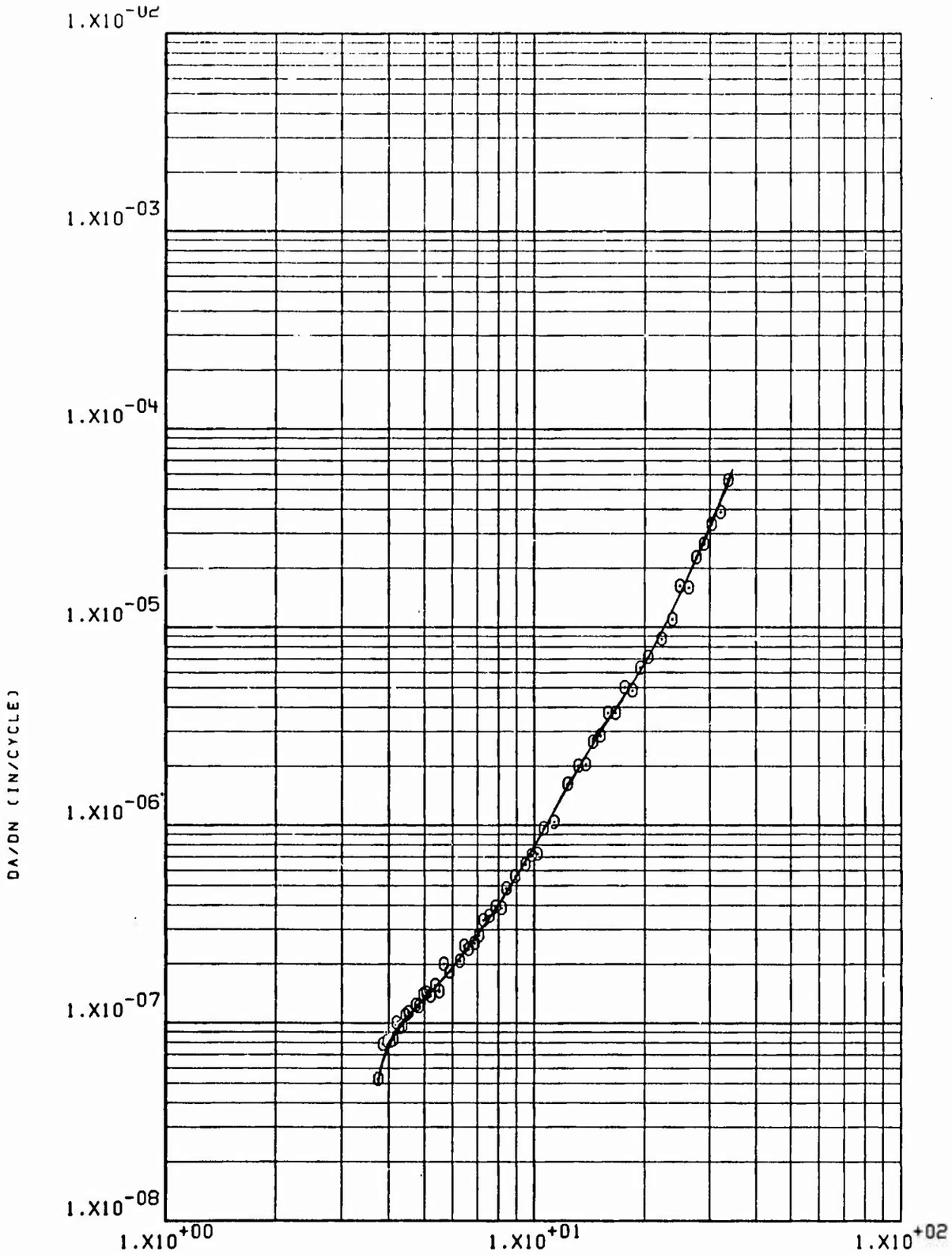
41 NWR 57-21 PH13-8MO H1000 LHA- RT R=.08 360CPM



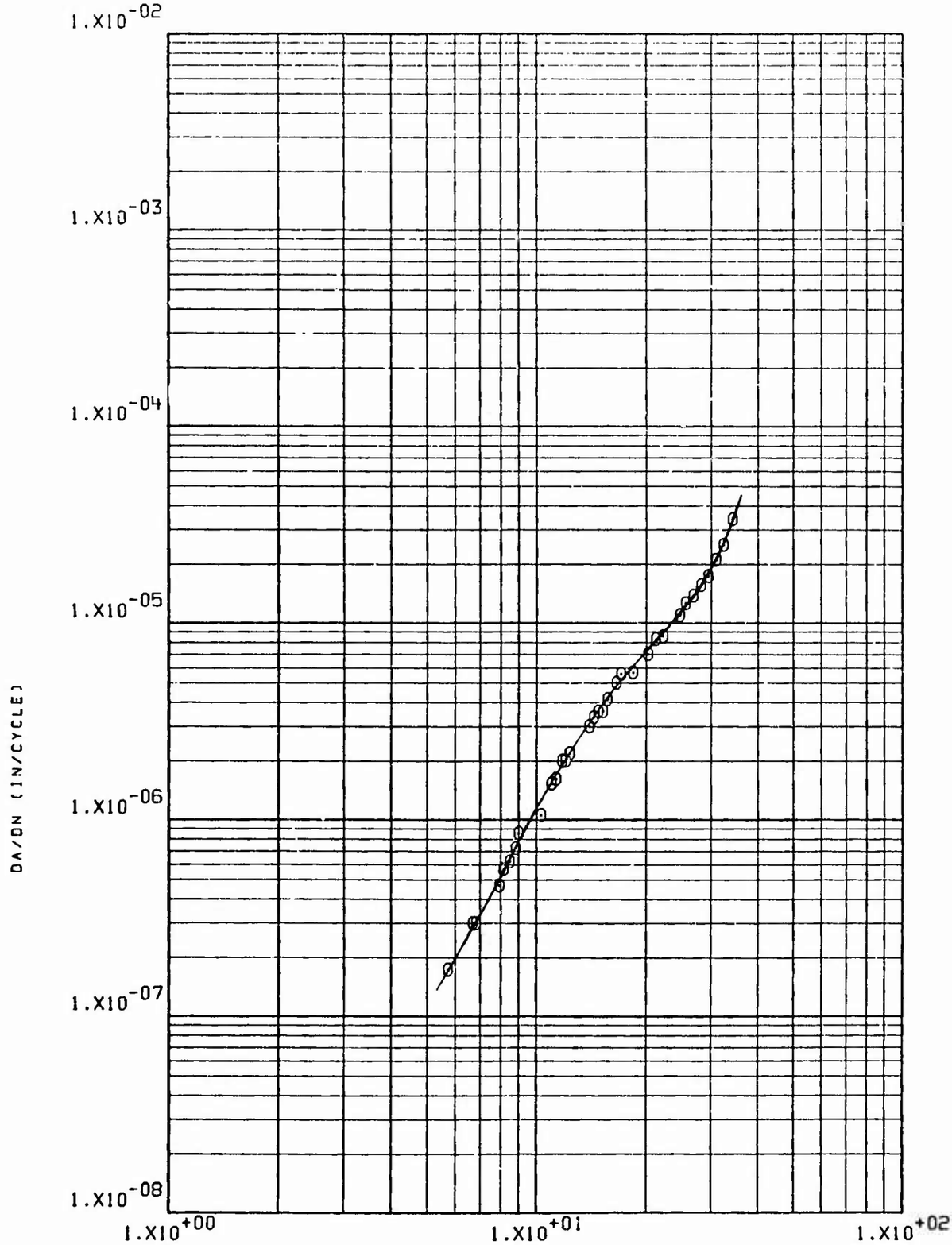
43 NWR 60-1 HP9-4-20 HT LHA RT 360CPM R=.08



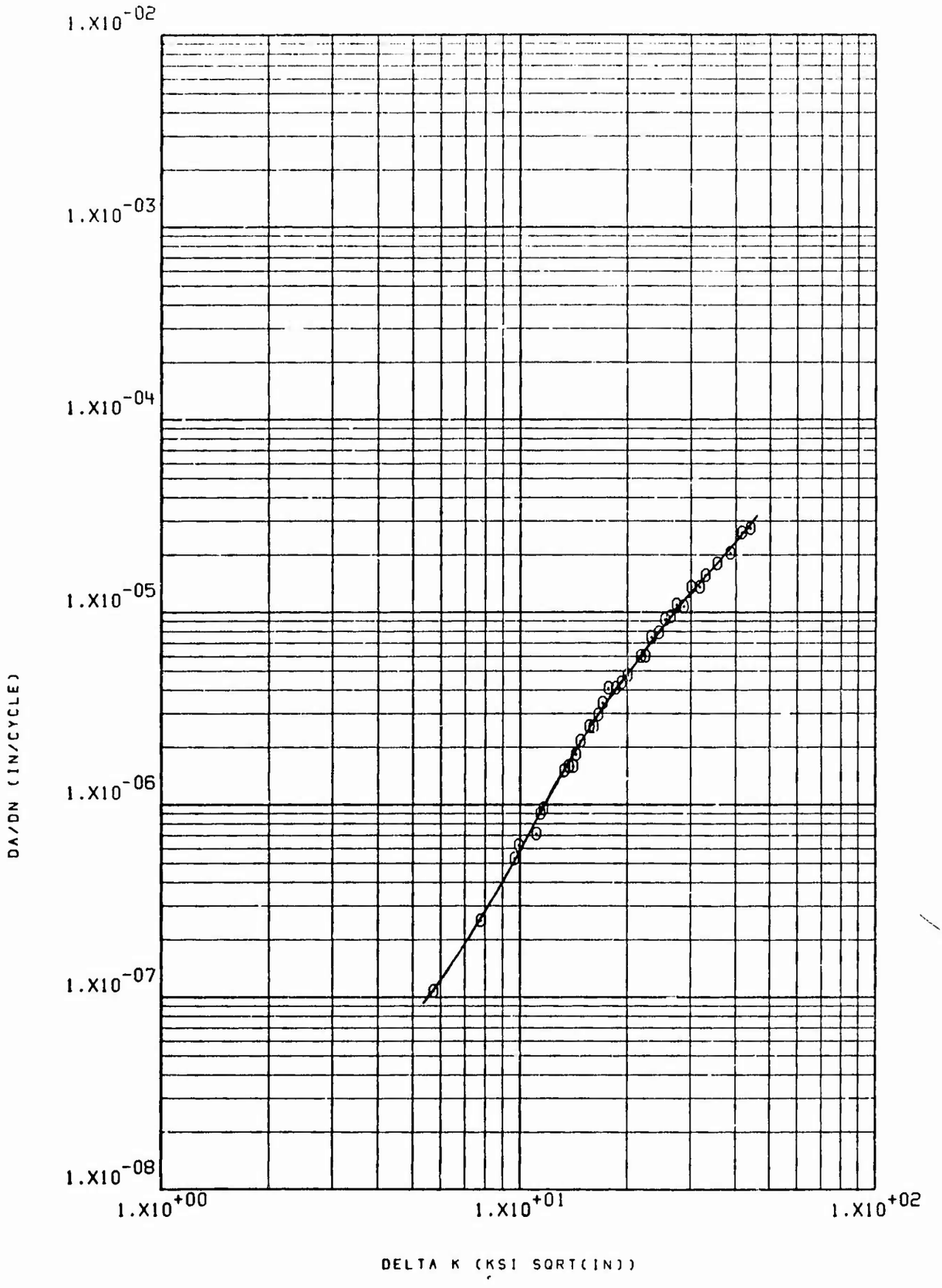
43 NRW 60-3 HP9-4-20 HT LHA RT 60CPM R=.08



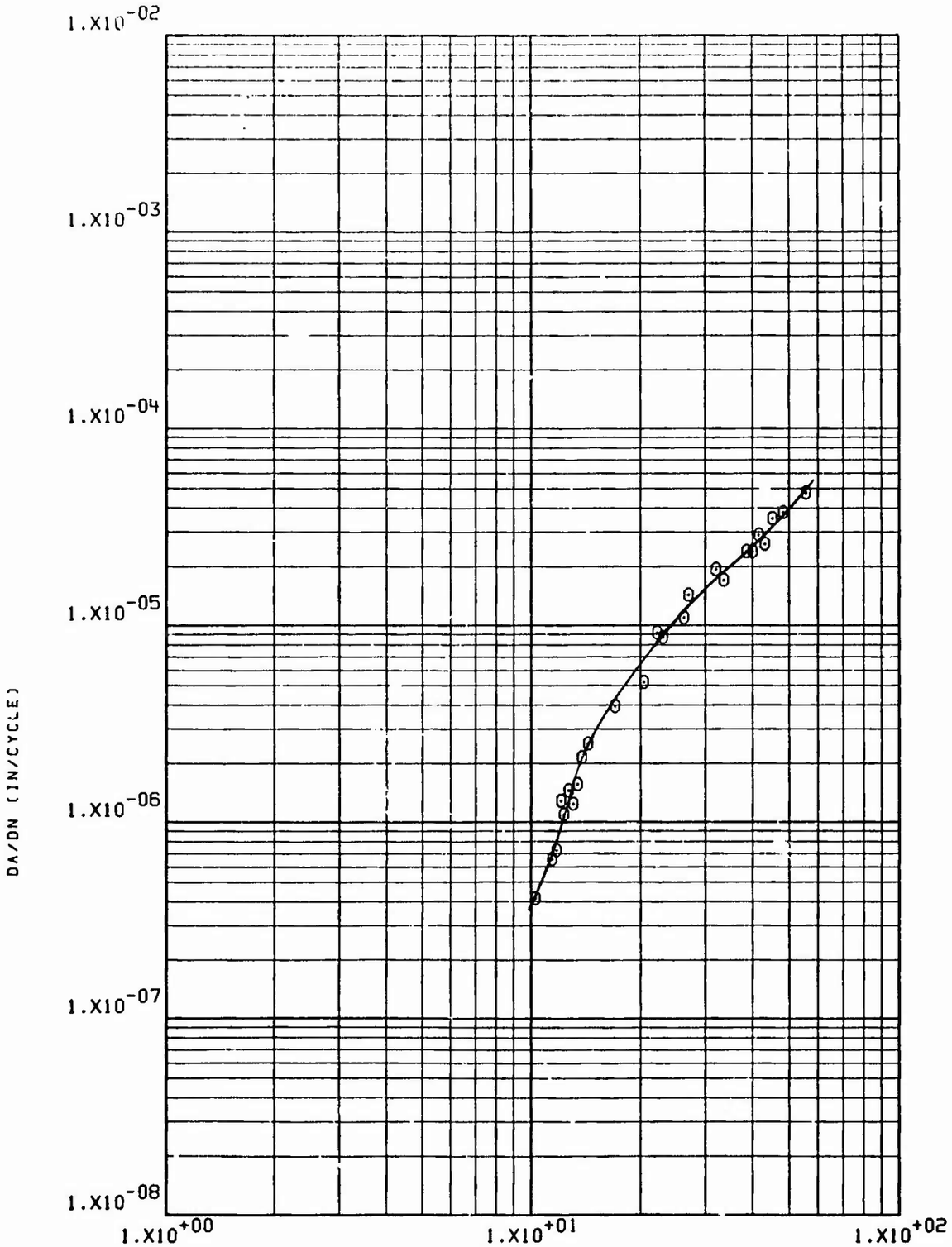
43 NRW 60-5 HP-9-4-.20 HT R.T. LHA 540CPM R=.08



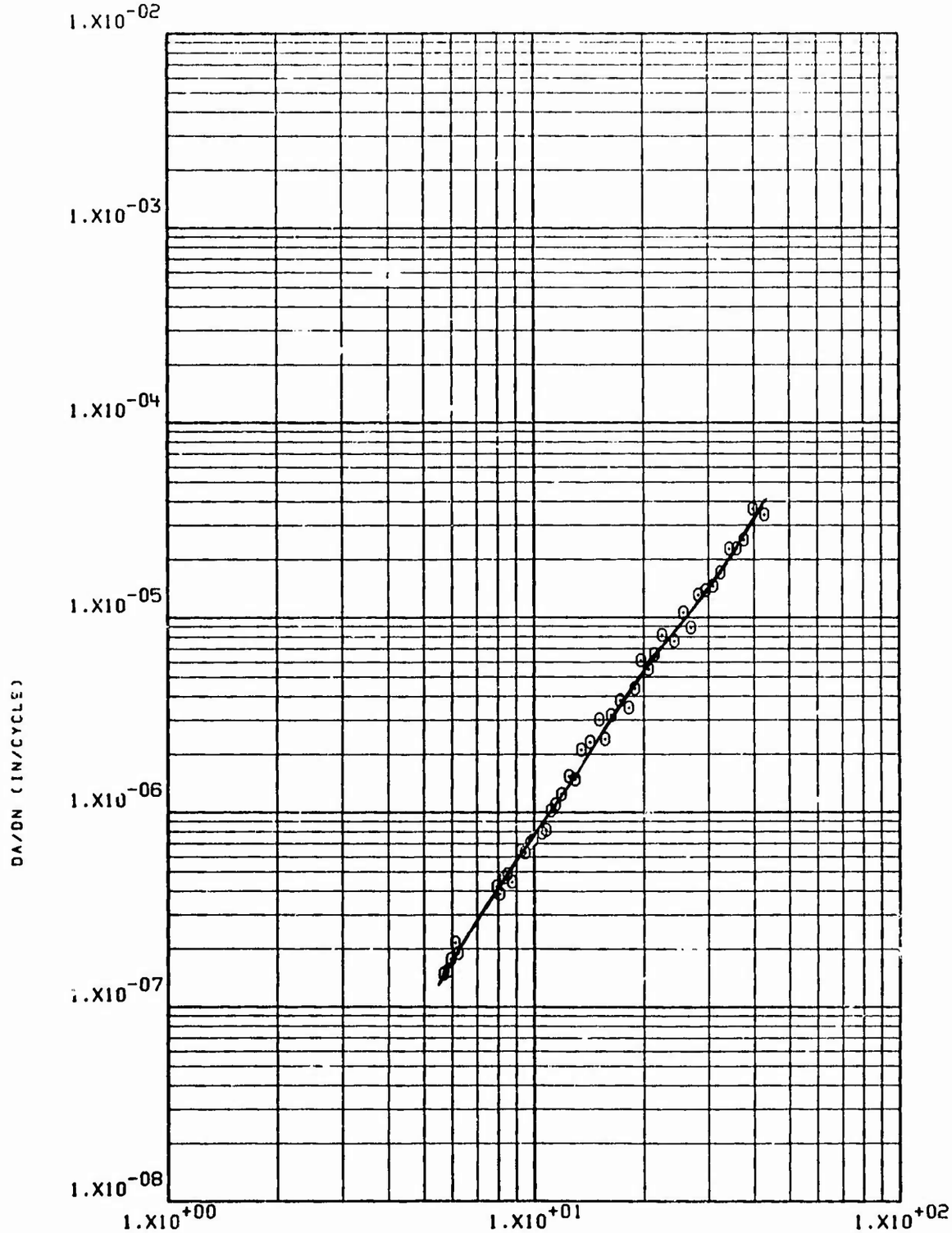
43 NRW 60-7 HP9-4-.20 HT LHA RT 360CPM R=.7



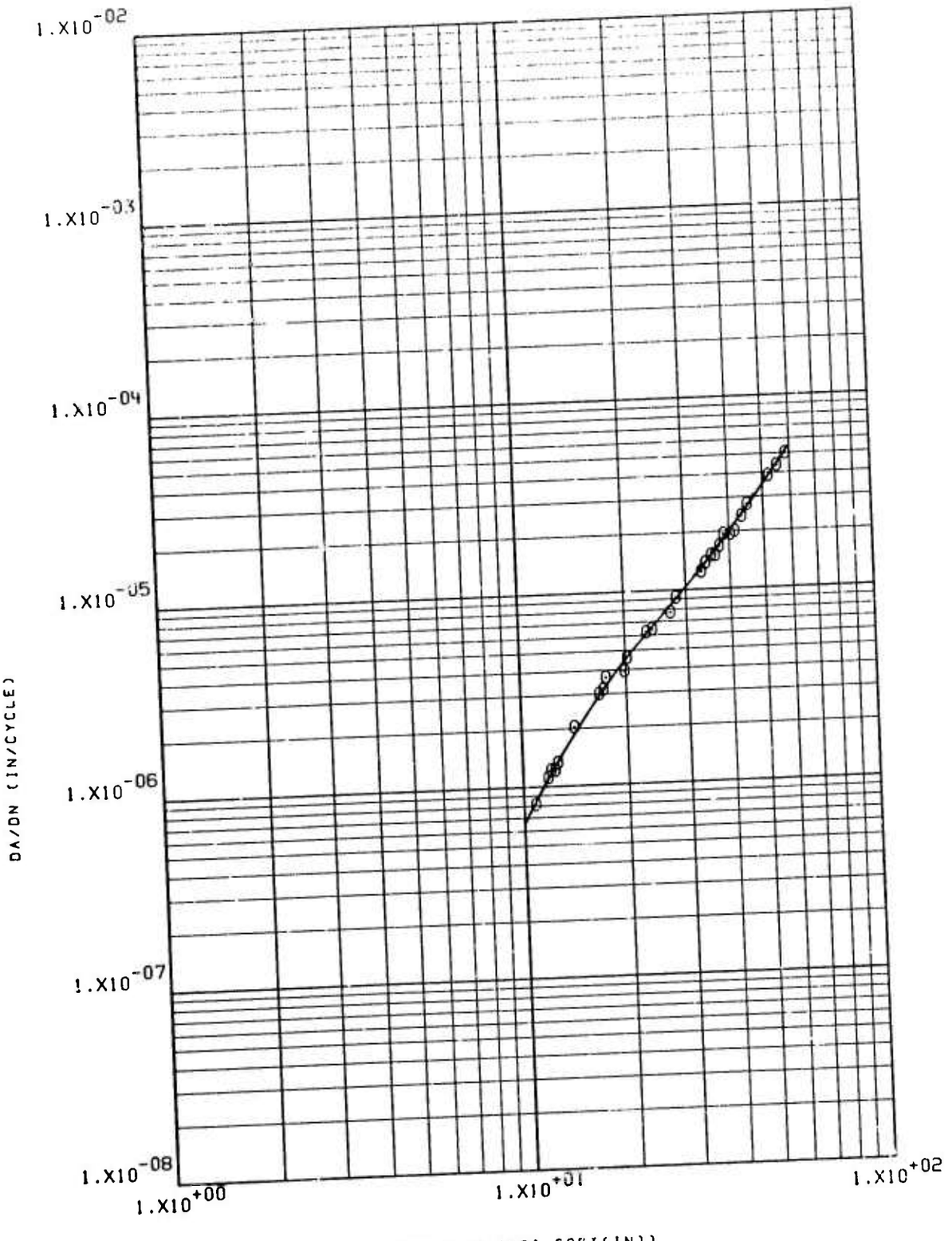
43 NRW 60-51 HP 9-4-.20 HT SCS RT 60CPM R=.08



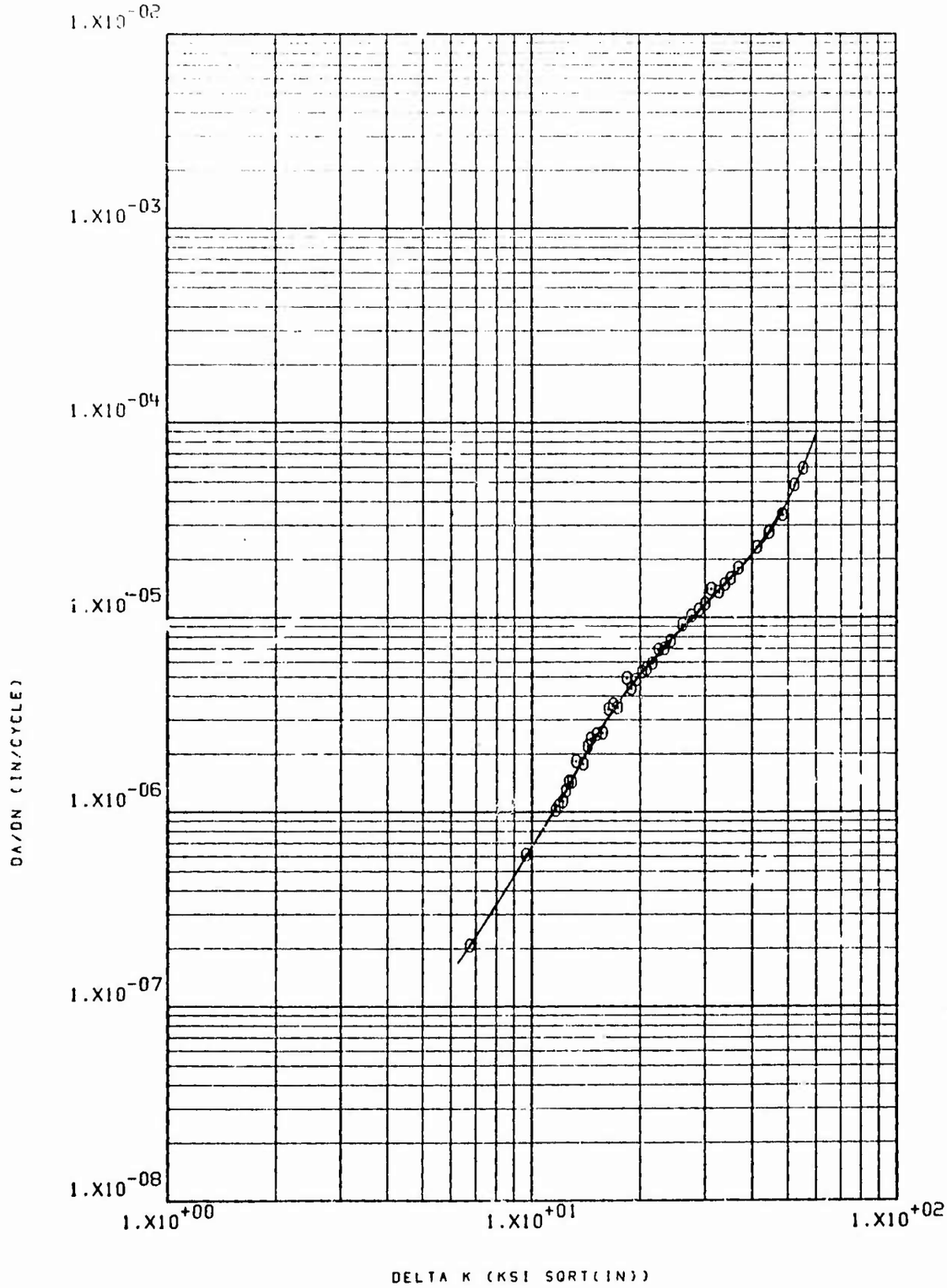
43 NRW 60-53 HP 9-4-20 HT 100% HUMIDITY RT R=.08 6CPM



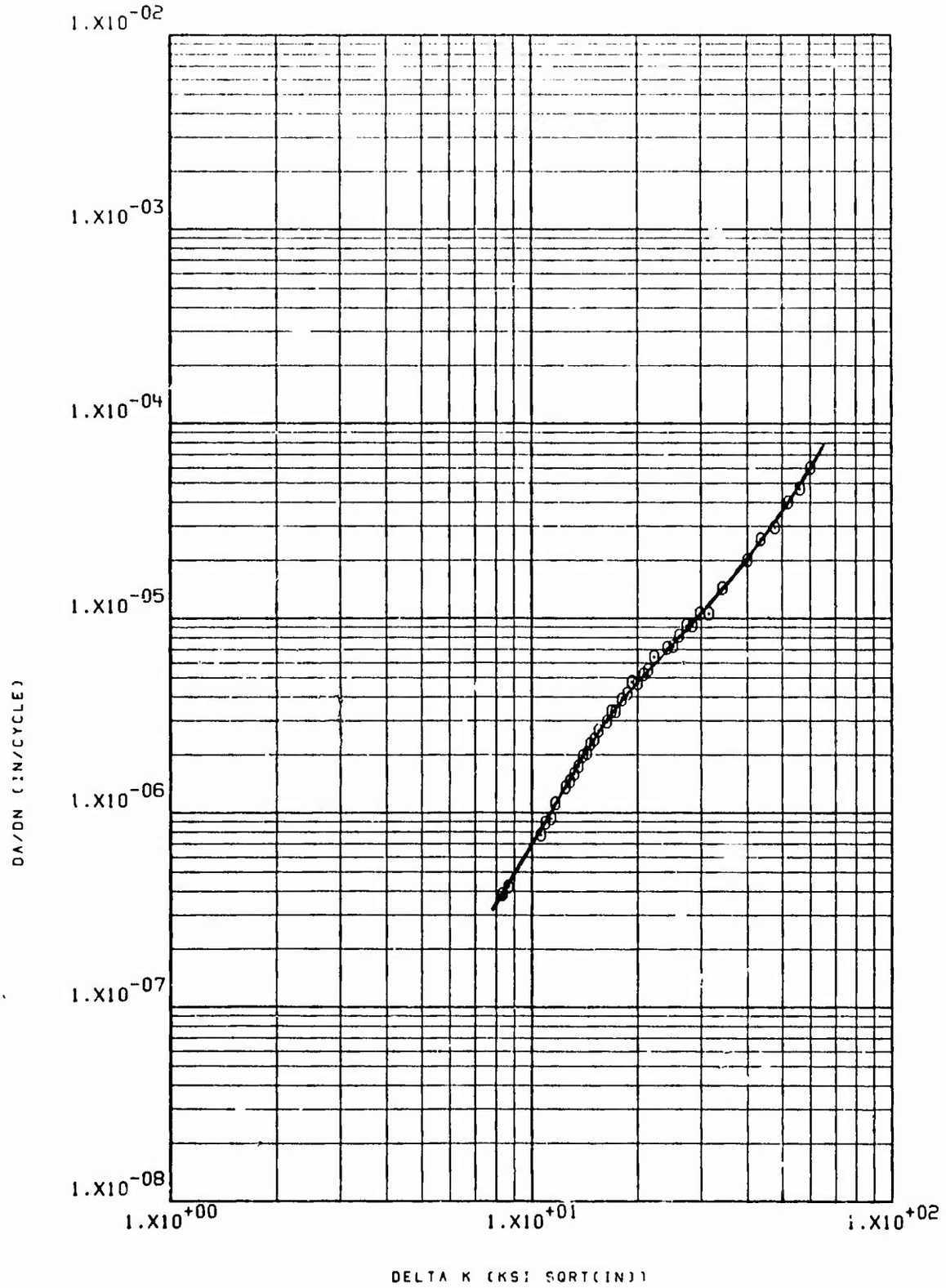
43 NRW 60-55 HP-9-4-.20 HT STW RT R=.08 60 CPM



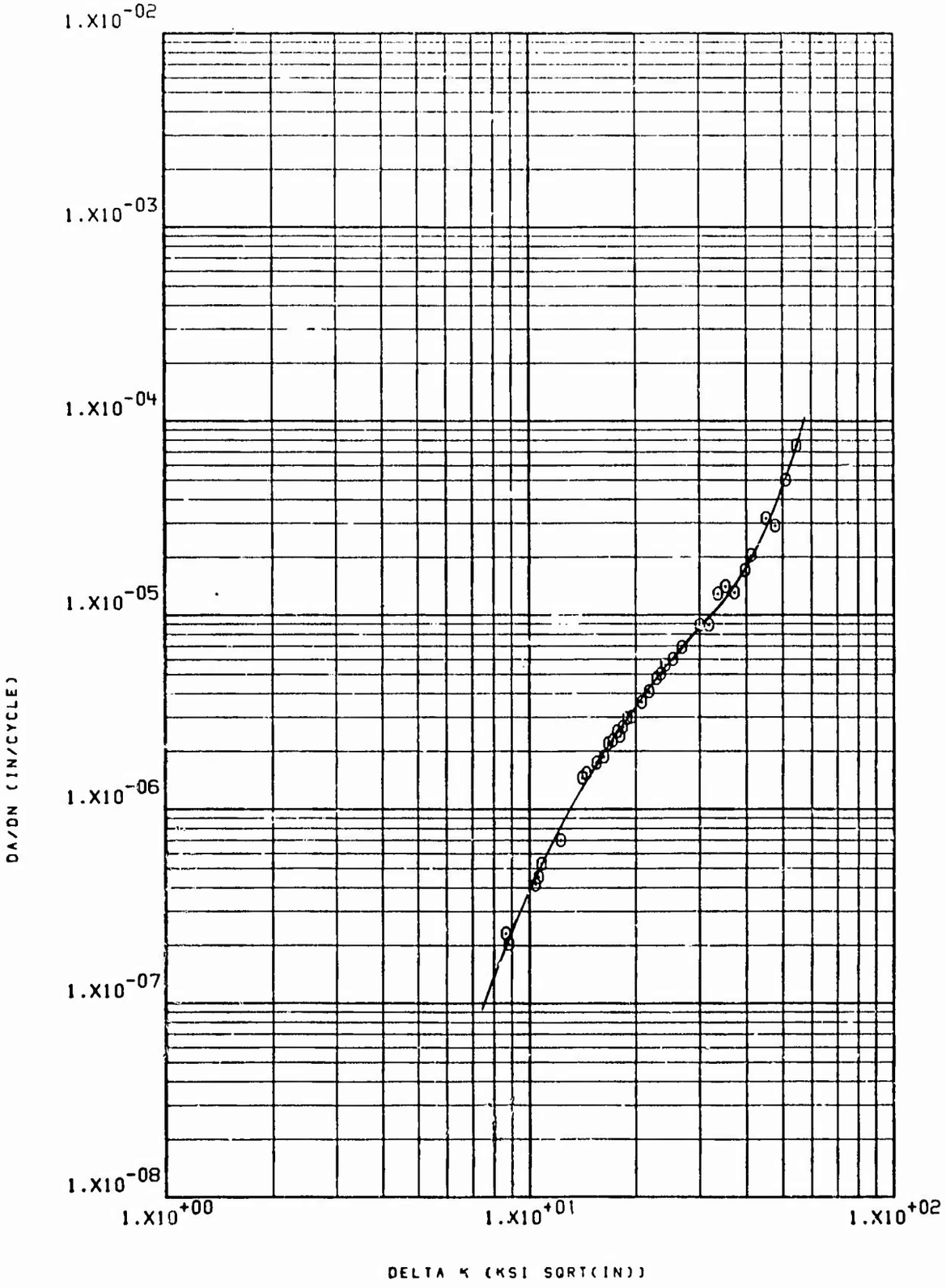
43 NRW 60-57 HP 9-4-20 HT LHA RT R=.08 6CPM



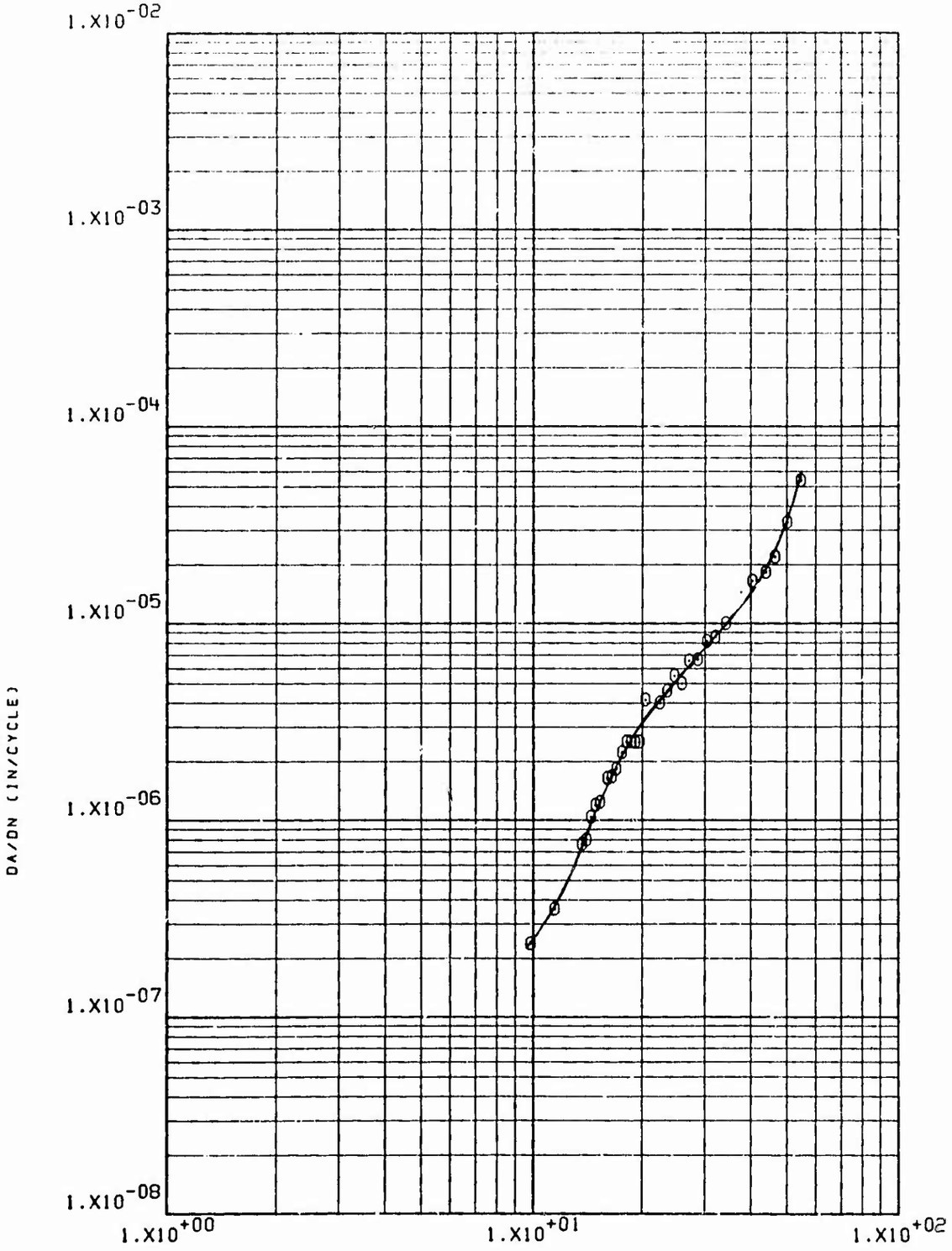
43 NRW 60-59 HP3-4-20 HT LHA PT 360CPM R=.08



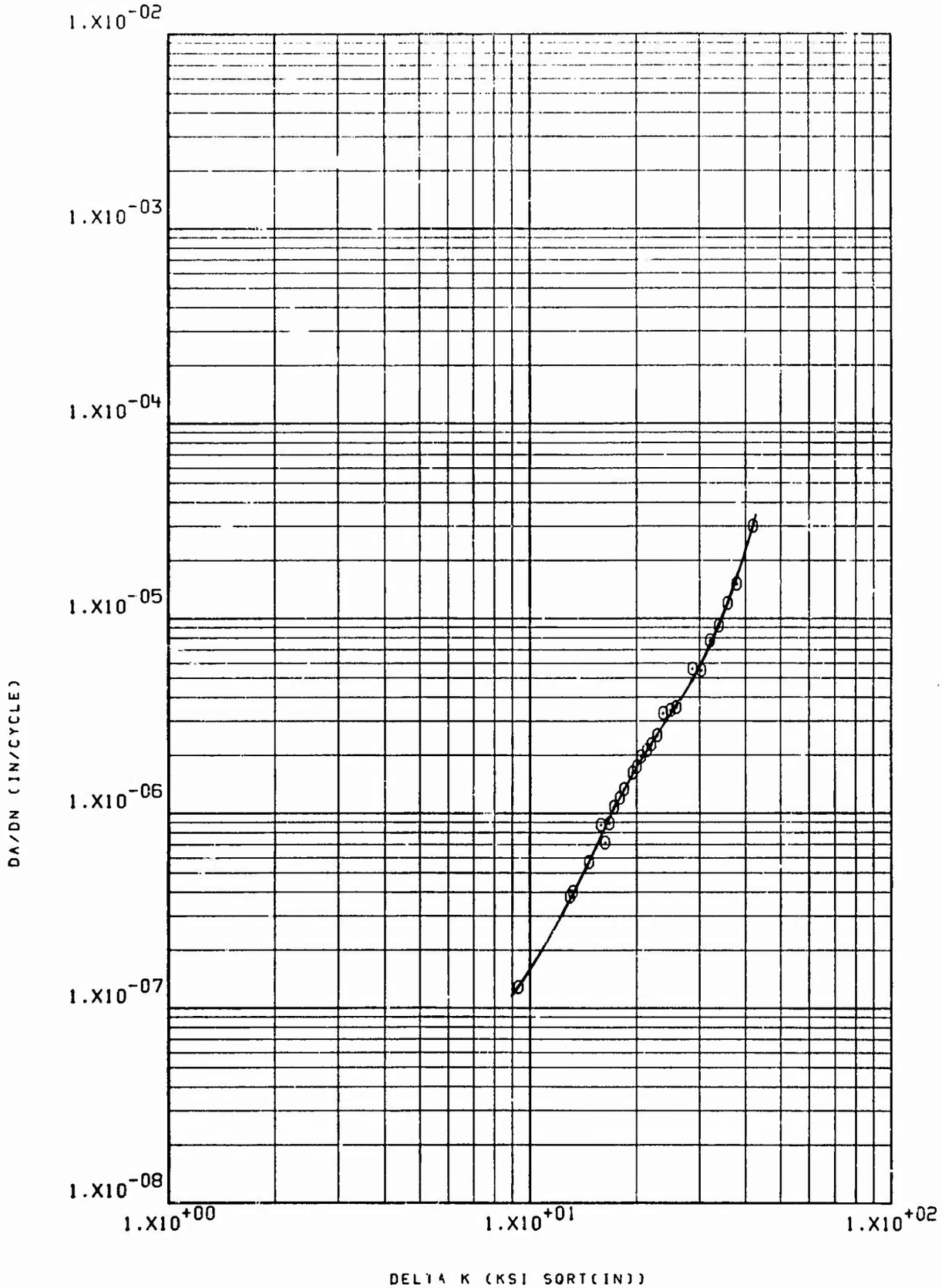
43NRW60-61 HP9-4-20 HT LHA RT 360CPM R=.08



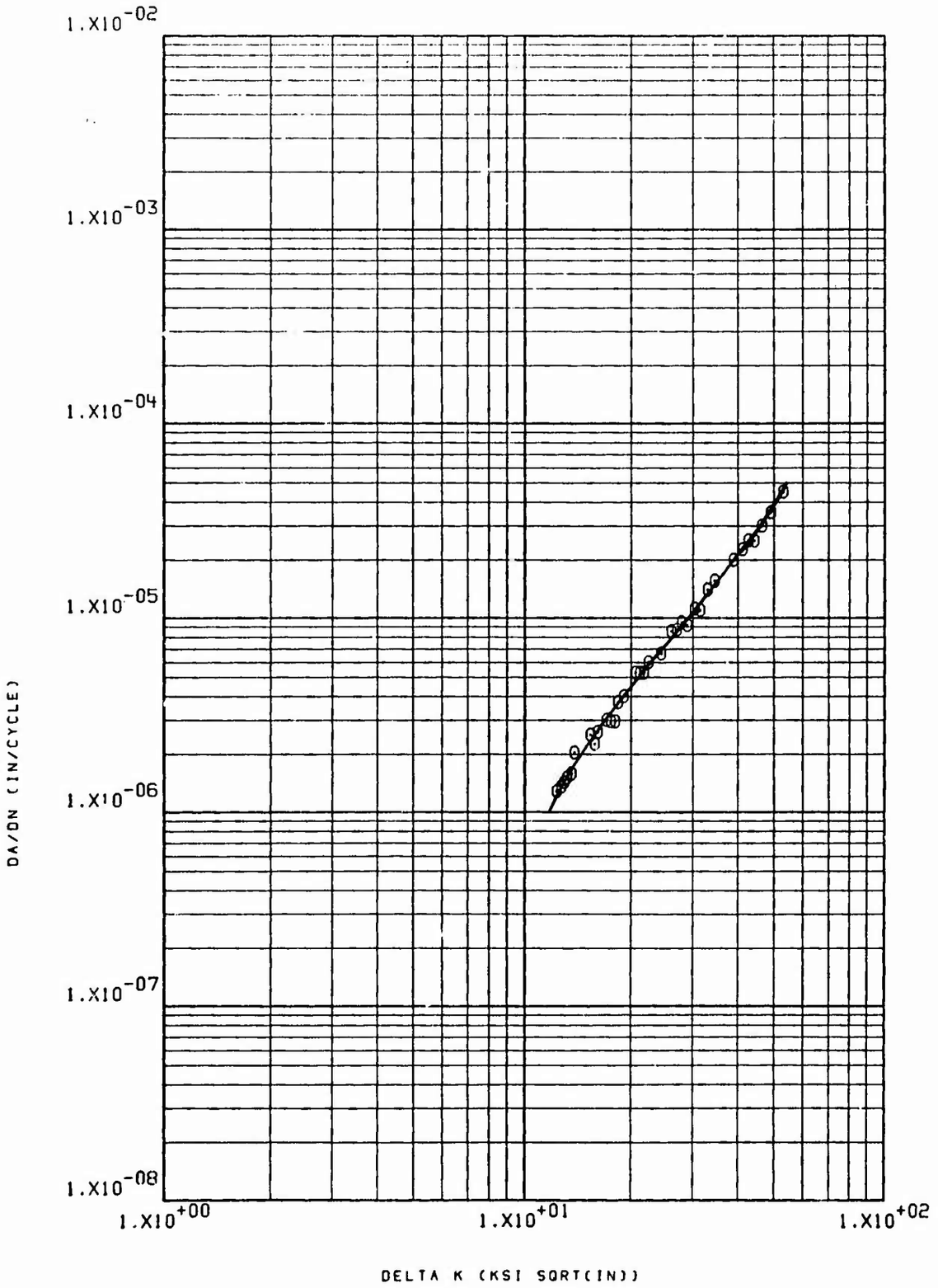
44NRW62-8 PH13-8 H-1000 LHA RT 360CPM R=.08



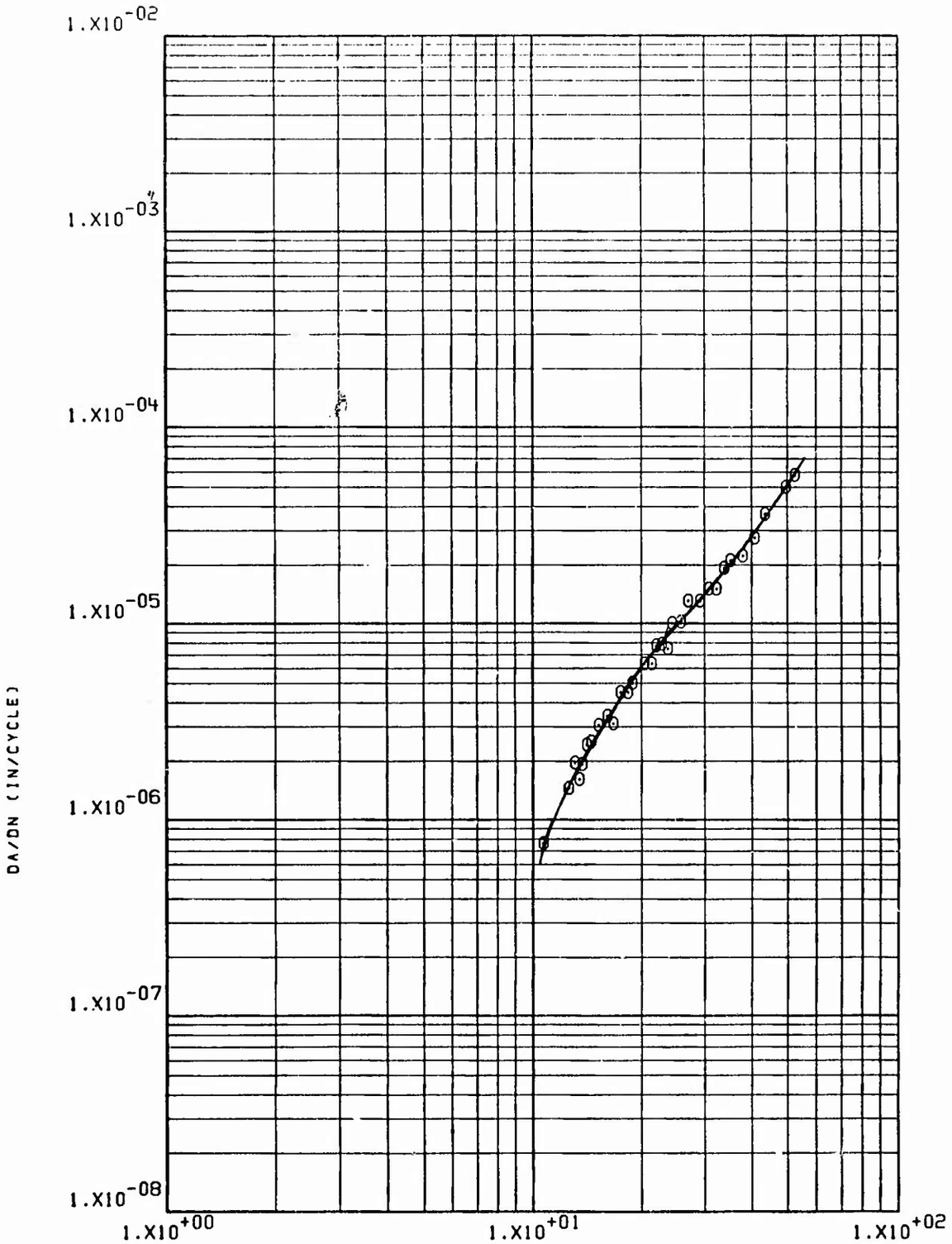
44 NWR 62-9 PH 13-8 H1000 FORG LHA RT R=.08 360CPM



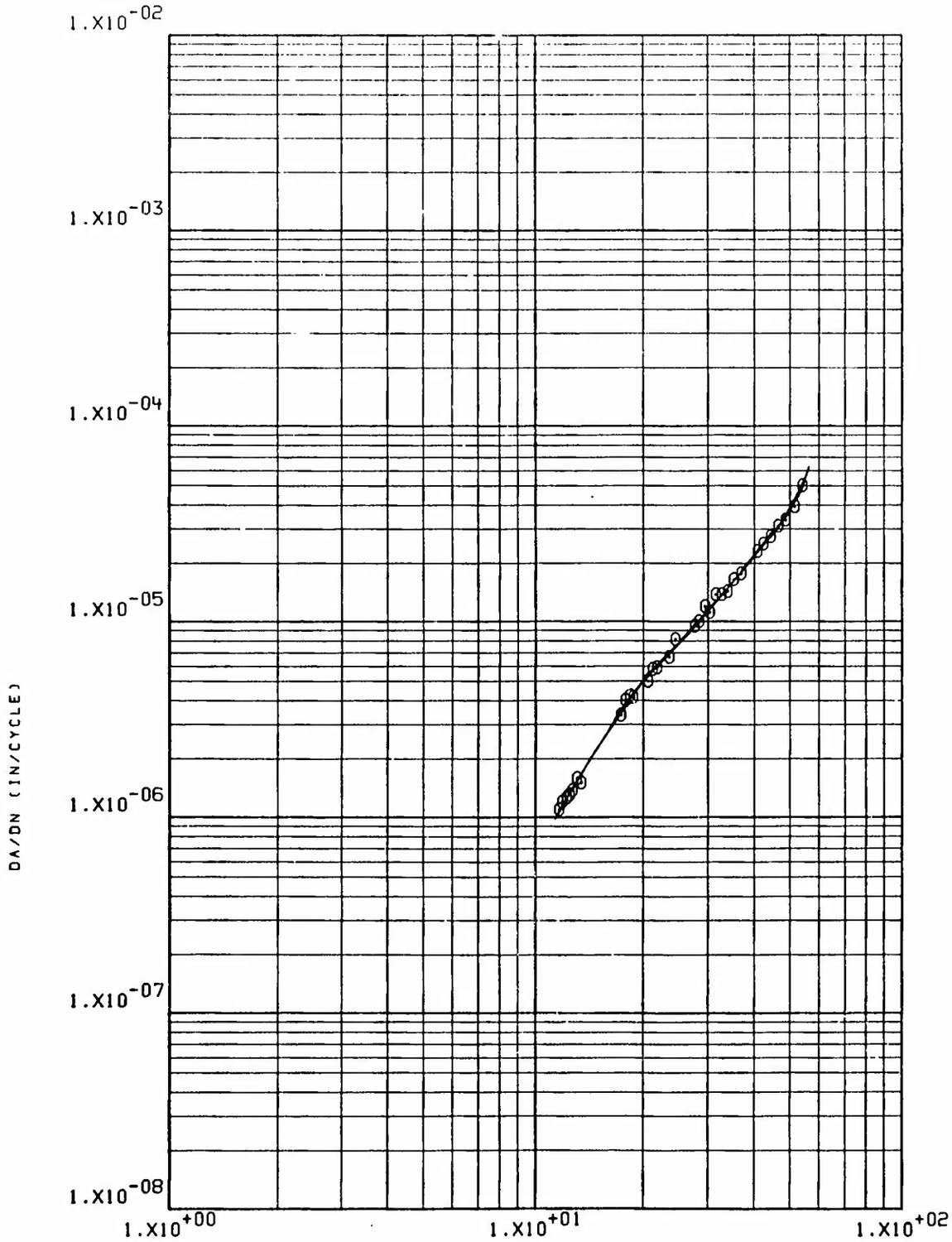
44 NWA 62-10 PH 13-8 H-1000 LHA -65F R=.08 360CPM



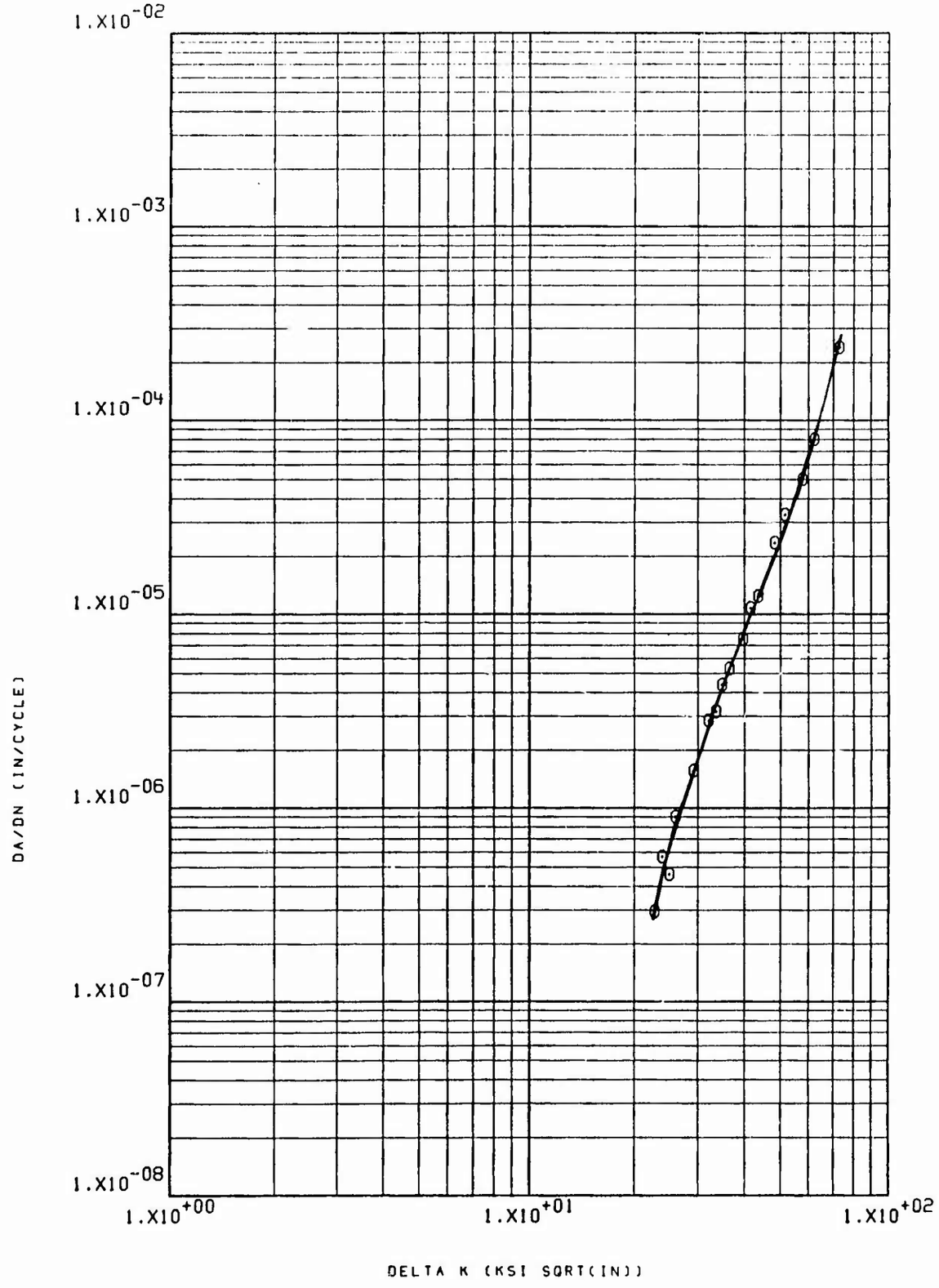
46 NRW 73-7 HP 9-4-20 VIM VAR LHA RT R=.08 360CPM



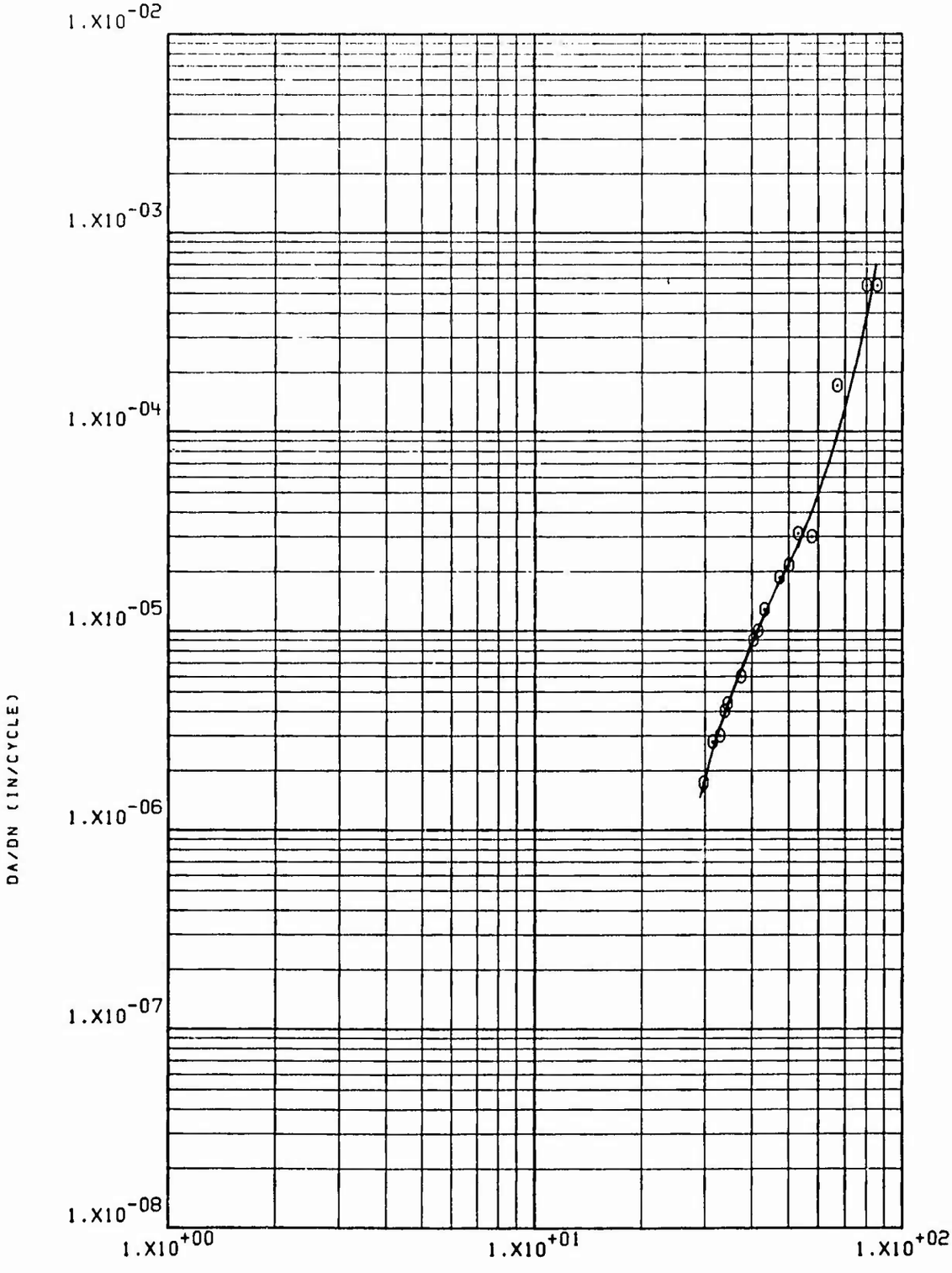
46 NRW 73-8 HP-9-4-20 VIM VAR 1000 HUMIDITY RT R=.08 60CPM



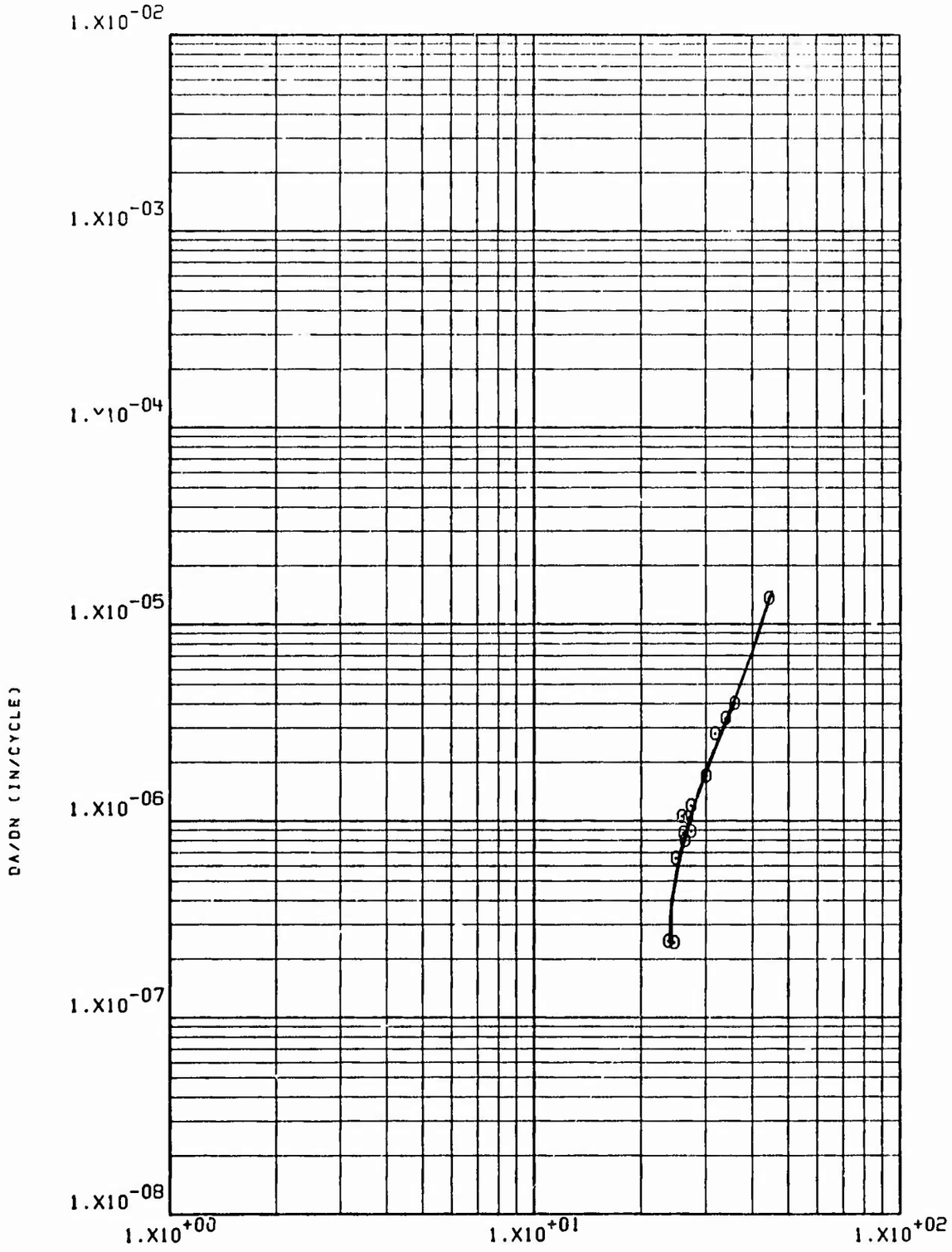
46 NWR 73-9 HP-9-4-20 VIM VAR LHA RT R=.08 360CPM



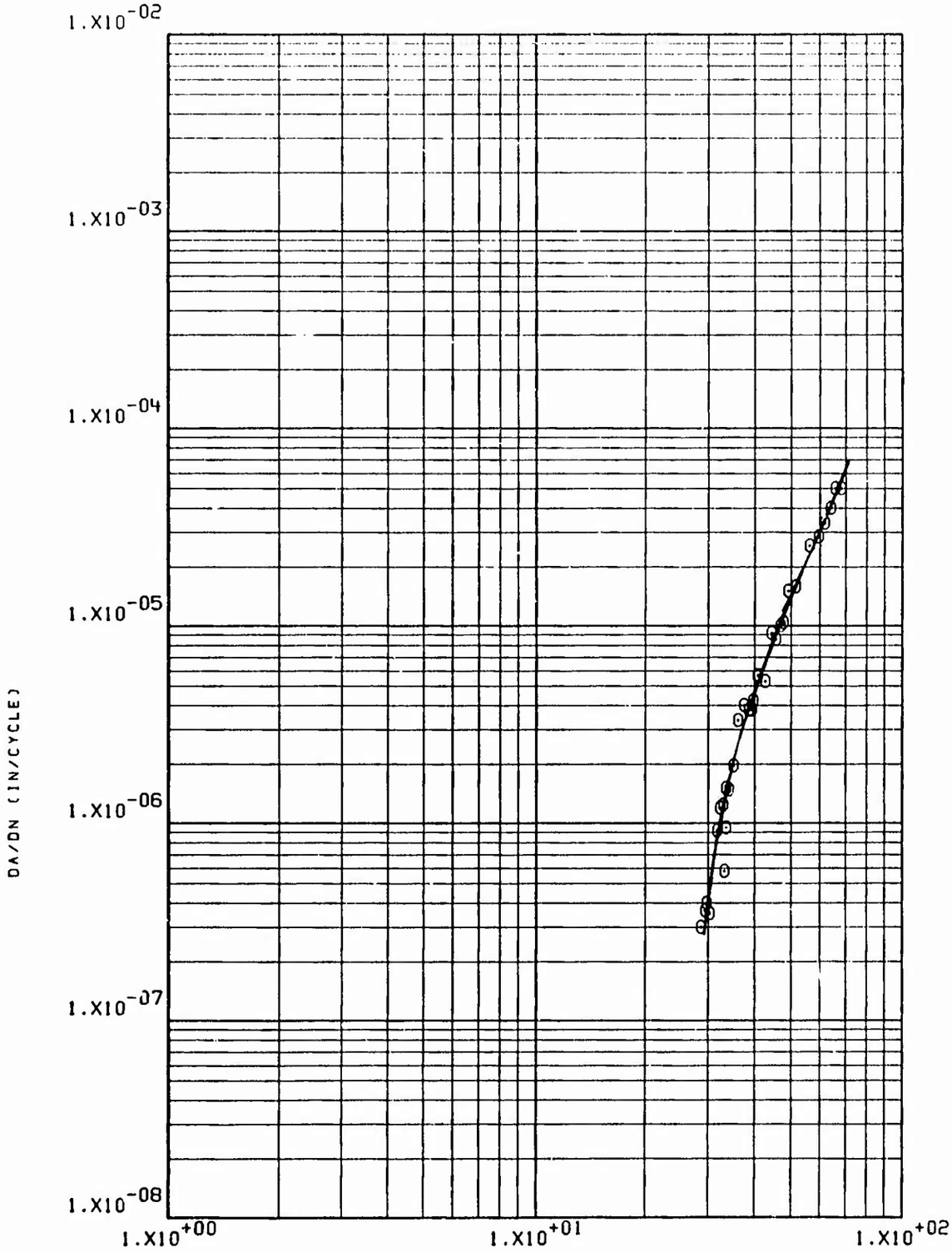
51 NTR 82-19 INCO 718 HT LHA 400 R=.08 360CPM



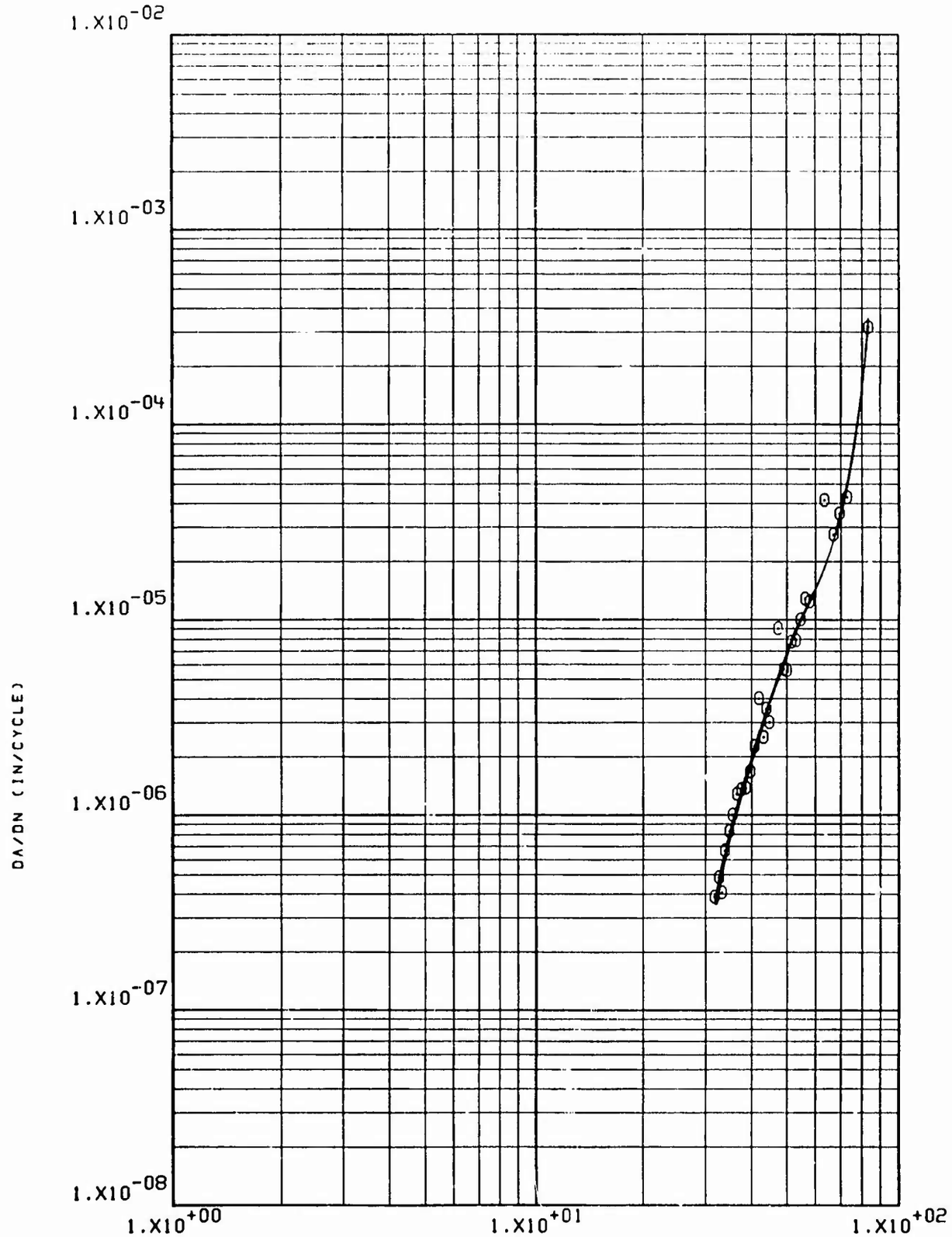
51 NTR 82-20 INCO 718 HT LHA RT R=.08 360CPM



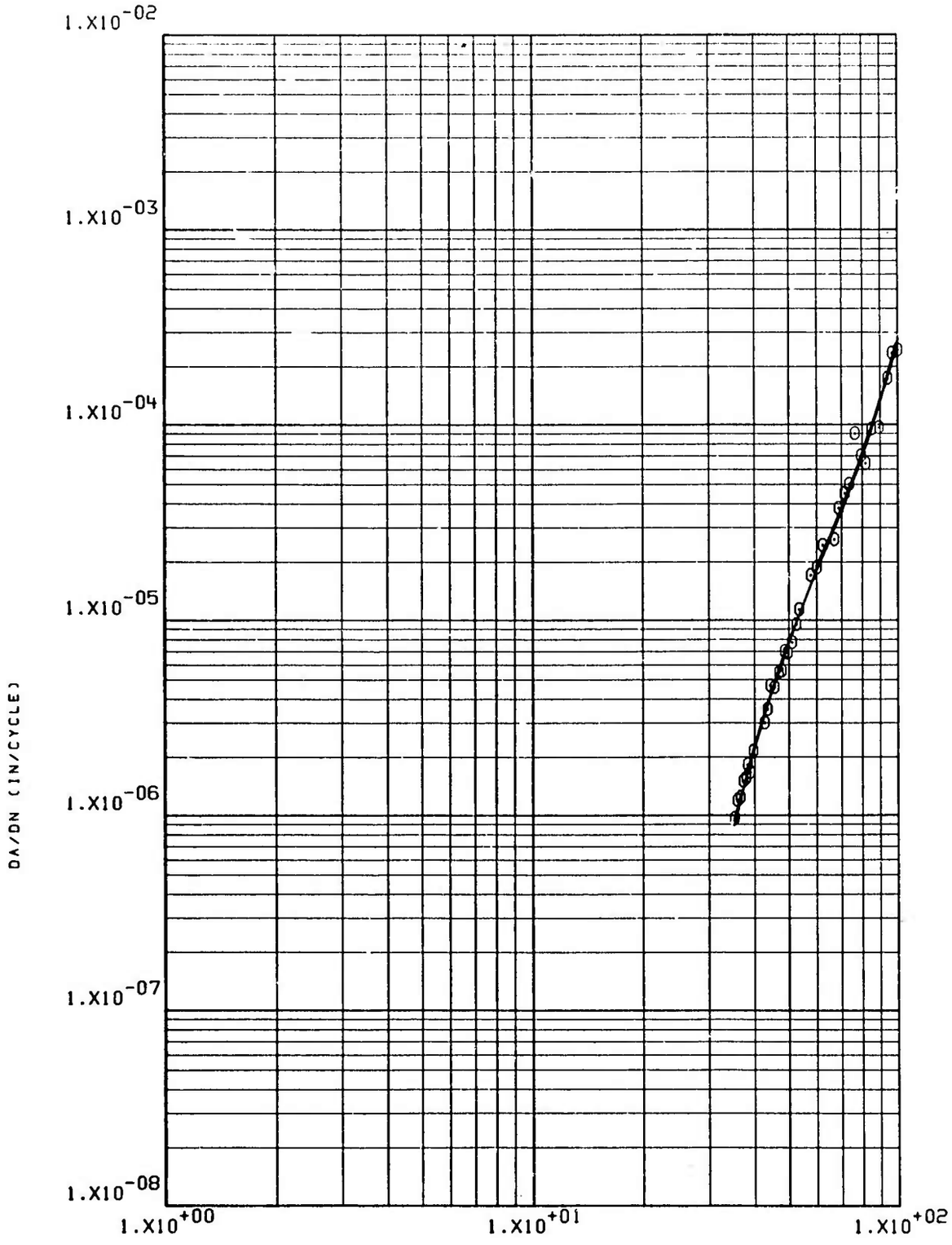
51 NTR 82-21 INCO 718 HT STW RT R=.08 60CPM



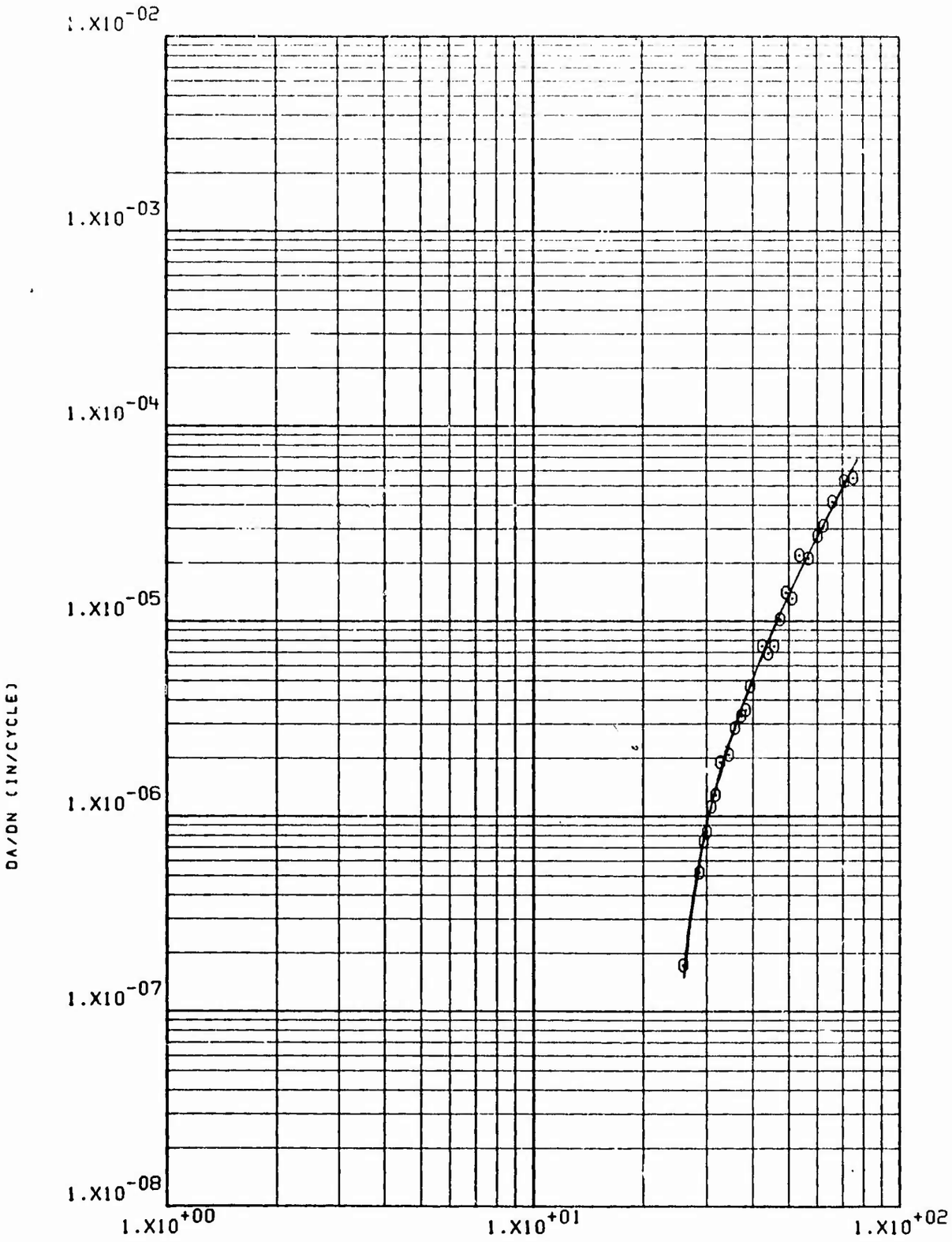
51 NWR 82-50 INCO 719 HT LHA RT R=.08 360CPM



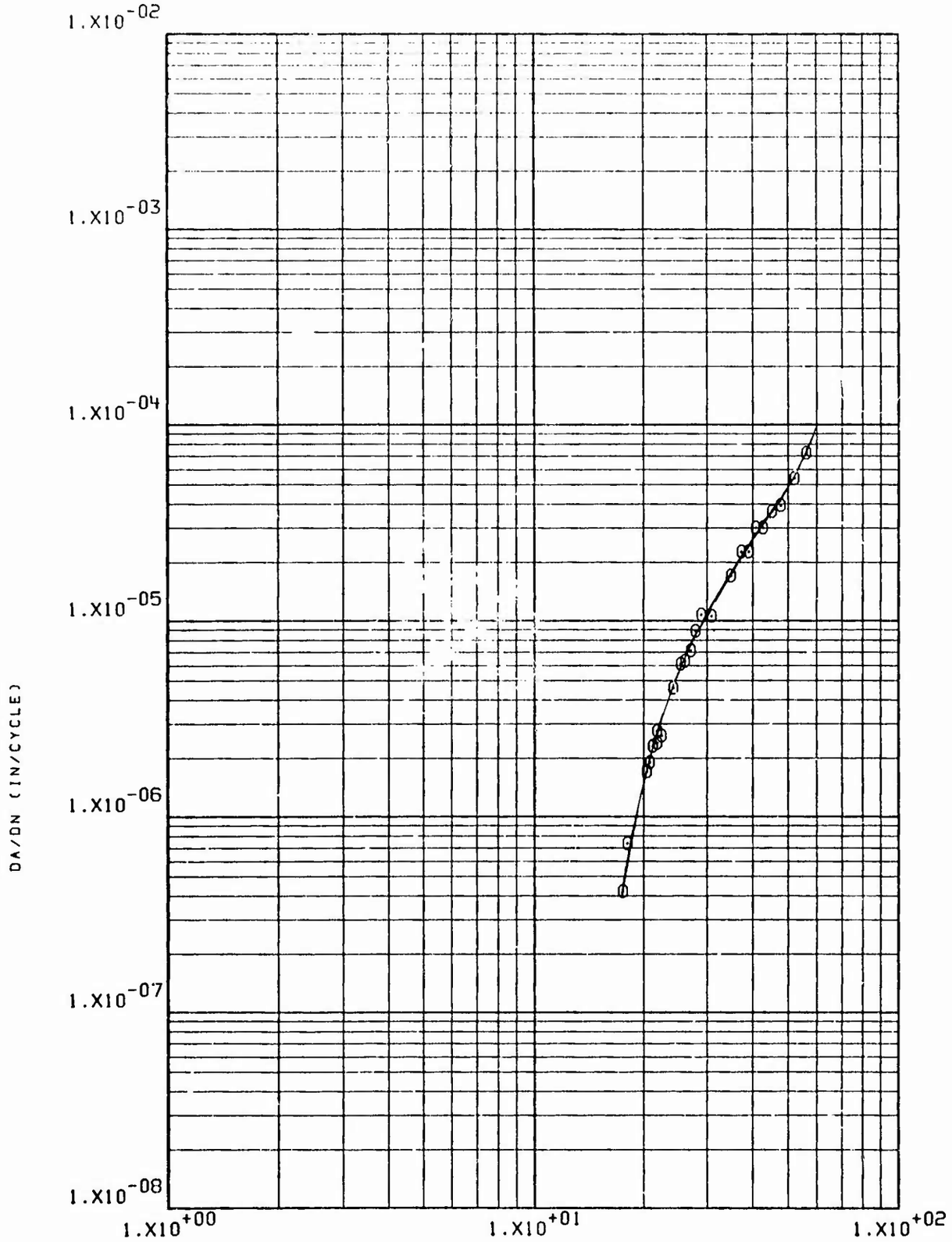
51 NWR 82-51 INCO 718 HT STW RT R=.08 60CPM



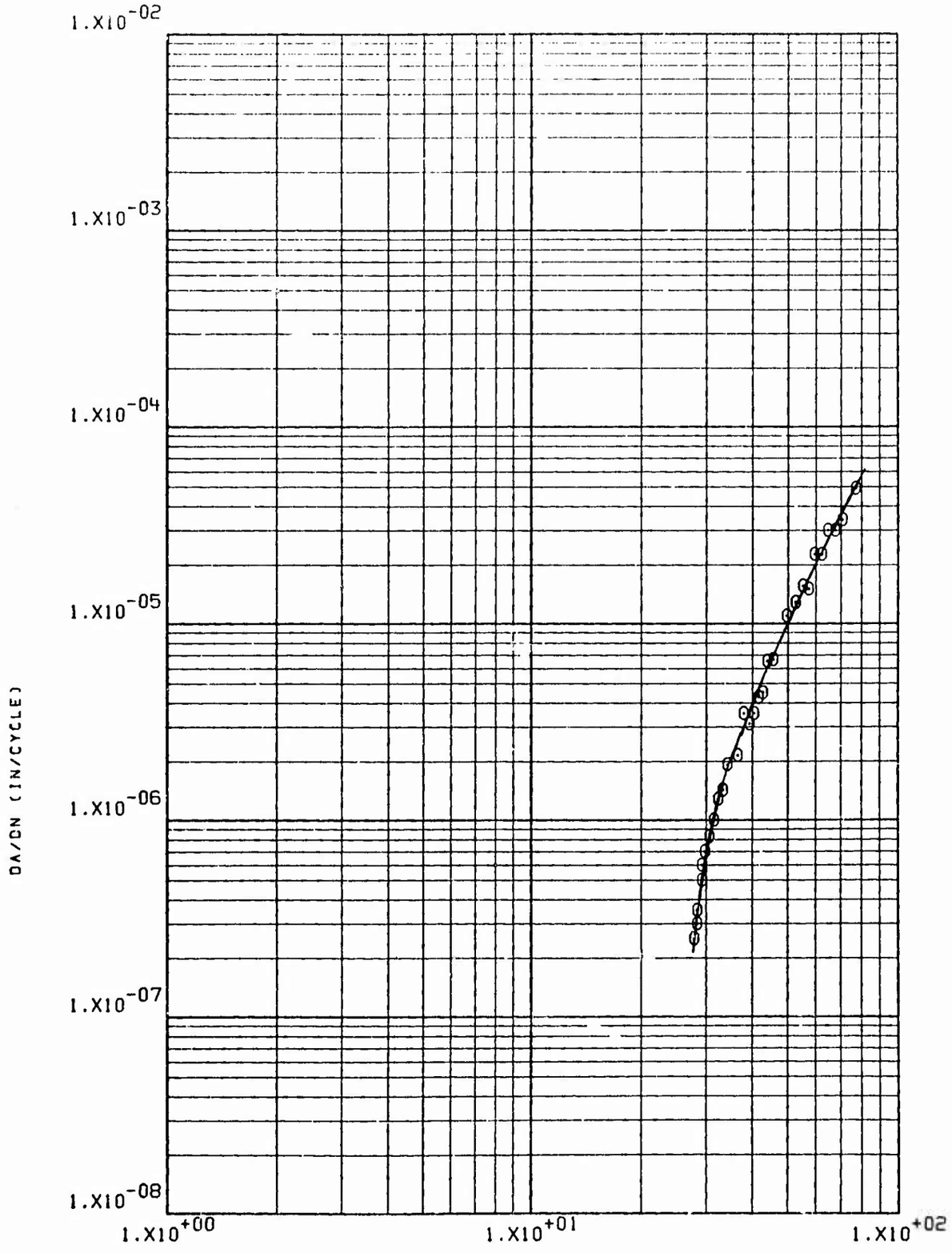
51 NWR 82-52 INCO 718 HT SCS RT R=.08 60CPM



51 NRW 82-53 INCO 718 HT LHA 400 R=.08 360CPM



51 NRW 82-54 INCONEL 718 H.T. LHA 400 360CPM R=.5



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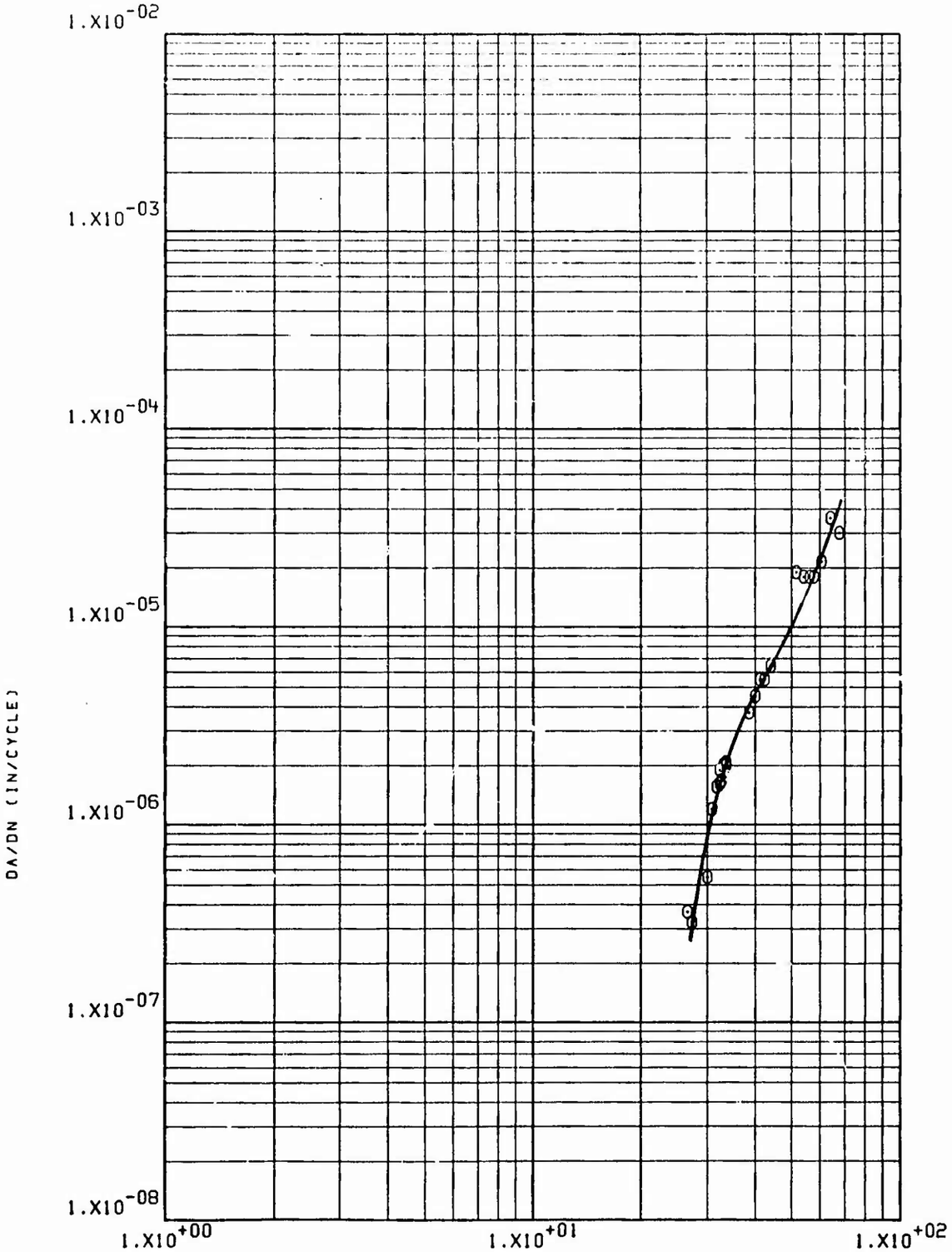
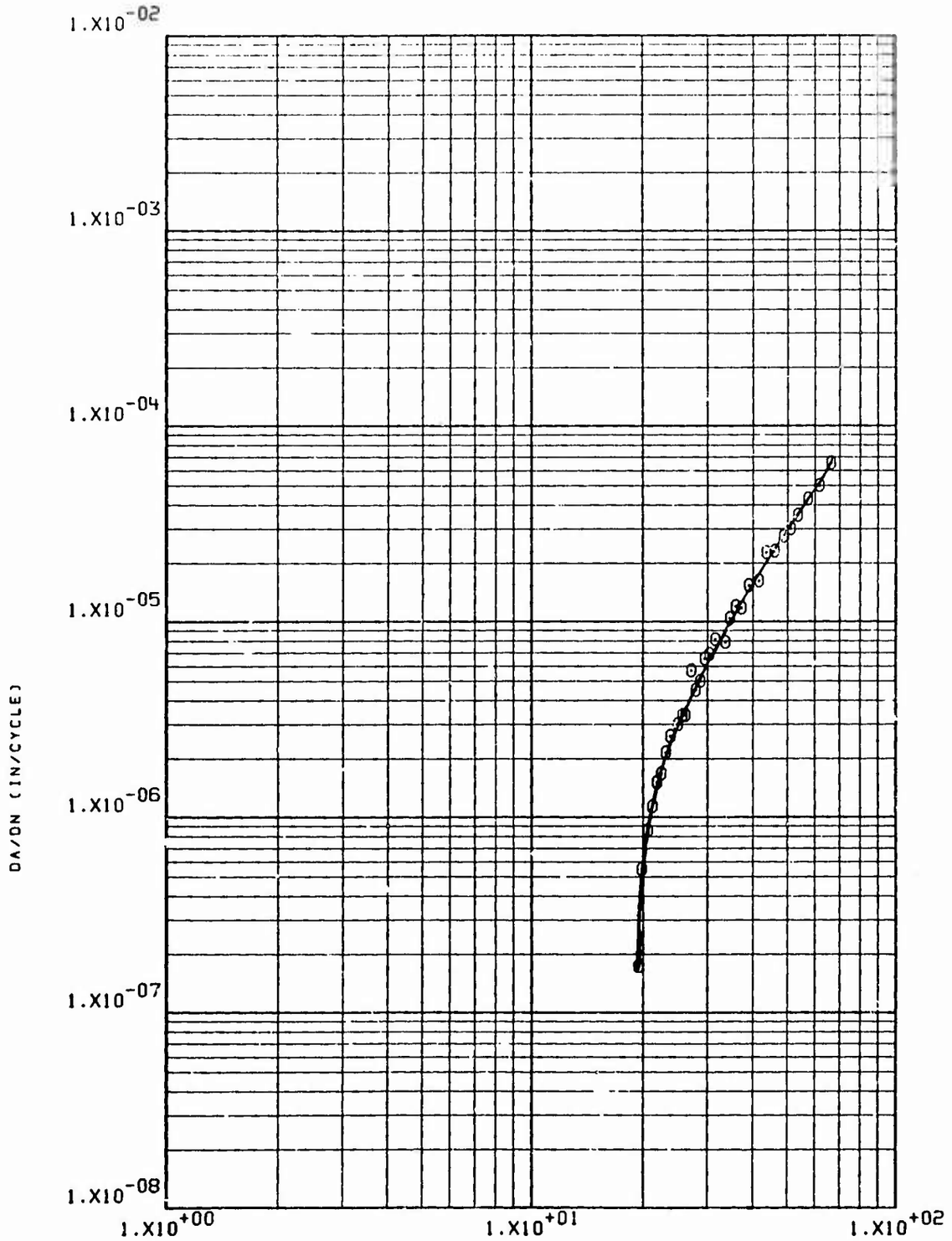
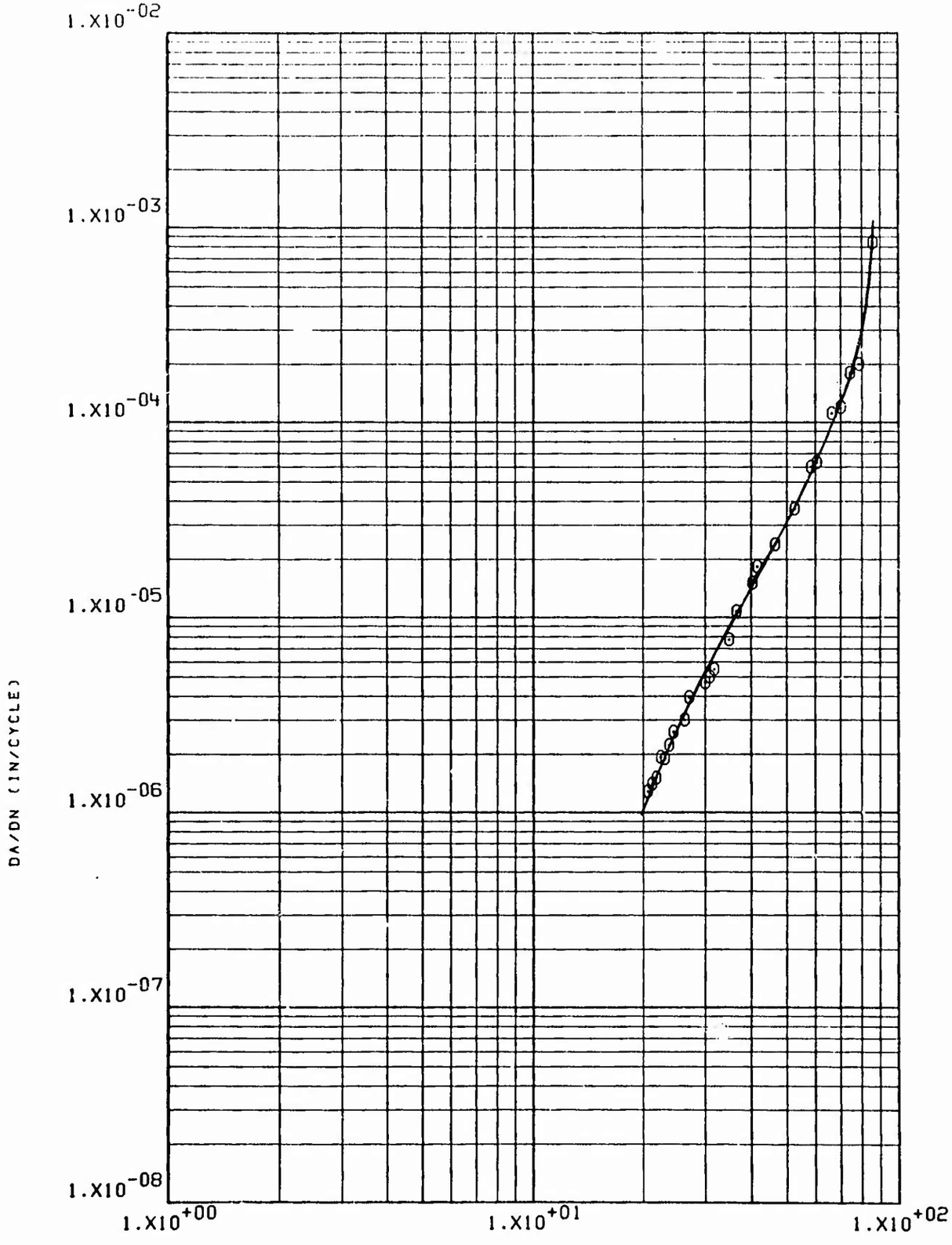


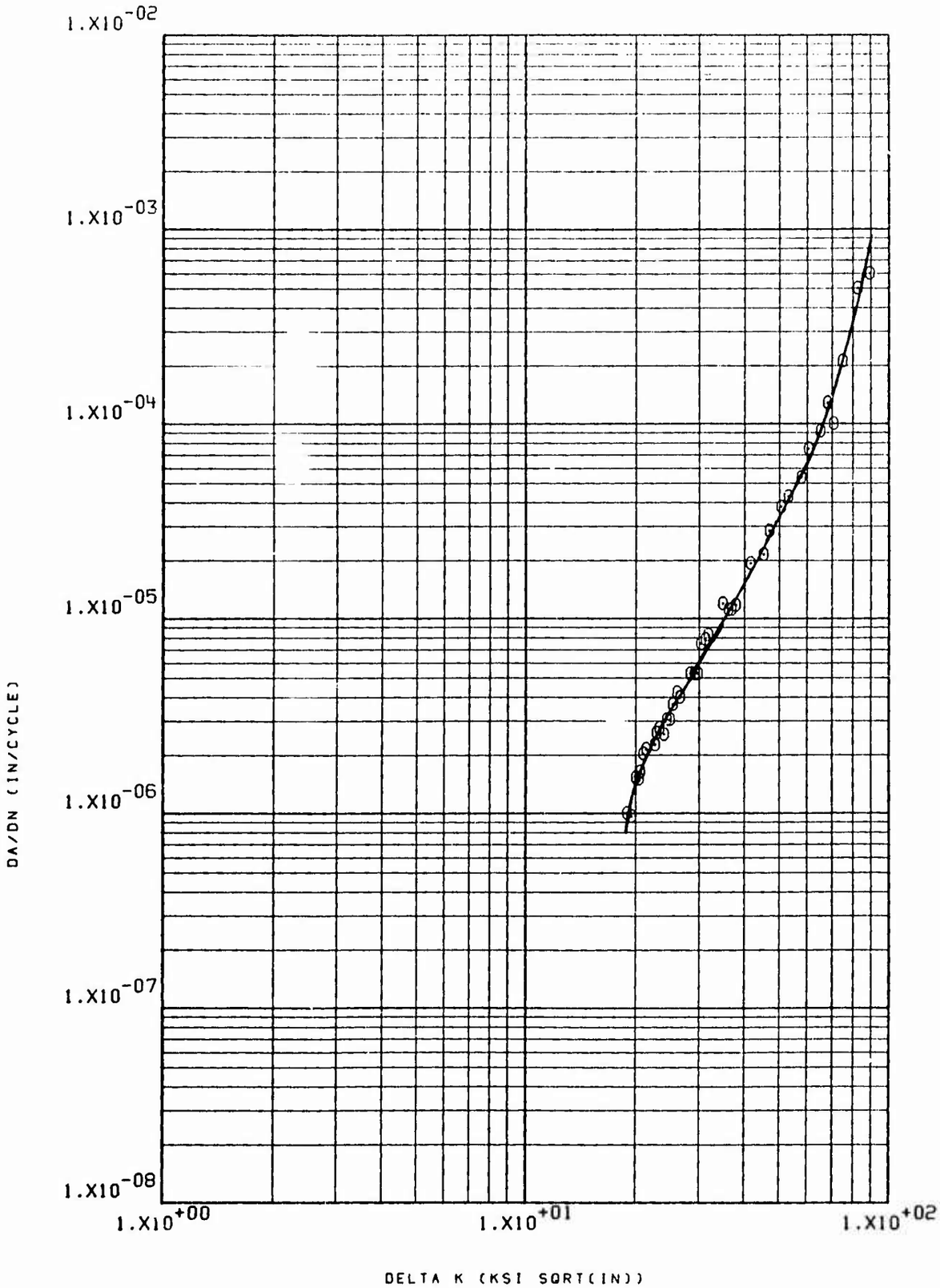
51 NRW 82-56 INCO 718 HT STW RT R=.08 60CPM



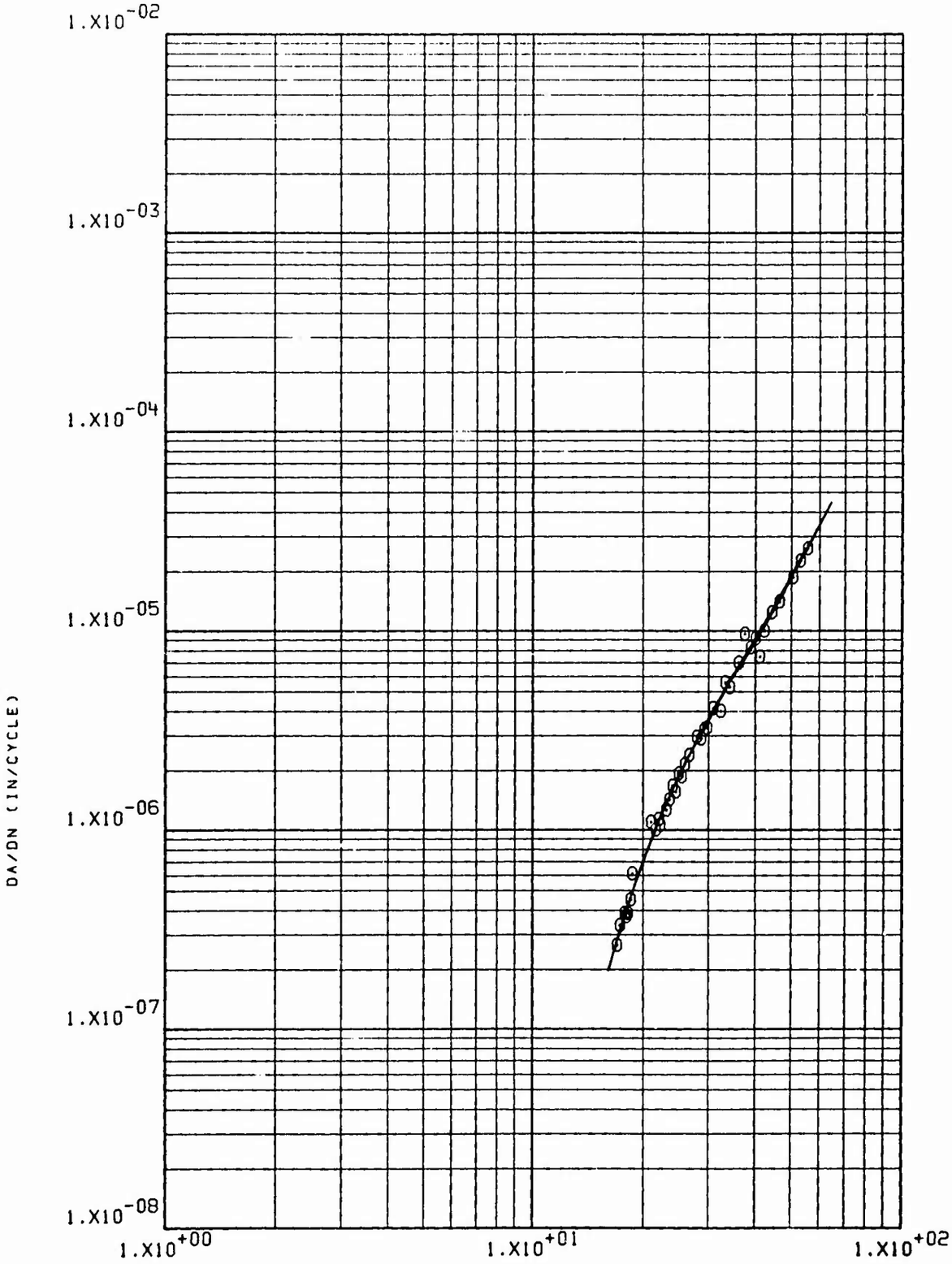
51 NRW 82-57 INCO 718 HT LHA RT R=.5 360CPM



53 NWR 98-1 INCO 718 HT LHA RT R= .08 360 CPM



53 NRW 98-2 INCO 718 HT LHA RT =0.5 360 CPM



53 NRW 98-3 INCO 718 HT LHA RT R=.08 360 CPM

APPENDIX D

FATIGUE CRACK GROWTH RATE CURVES FOR ALL TESTS OF WELDMENTS

APPENDIX D: INDEX OF FIGURES

Alloy and Condition	Figure No. (Specimen No.)	Crack Orientation and Location	"W" Nominal, Inches	"t", Inches	Environment	Test Temp	"R"	Freq. (cpm)	Remarks	Page No
HP9-4-.20 Preweld Condition: Heat Treated to 190-210 ksi UTS.										1 to 10
Postweld:										
950F, 2 hrs.	33 NRT A503	RT-HAZ	4.0	.50	LHA	RT	.08	60		D-1
" "	33 NRT A521	" "	"	"	"	-65	"	"		D-2
" "	33 NRT A522	" "	"	"	Dist.Water	RT	"	"		D-3
950F, 2 hrs.	37 NRT A301	RT-Weld	"	"	" "	"	"	"	Weld Overlay	D-4
None	37 NRT A304	" "	"	"	" "	"	"	"	" "	D-5
None	37 NRT A305	" "	"	"	" "	"	"	"	" "	D-6
950F, 2 hrs	37 NRT A308	" "	"	"	" "	"	"	"	Grindout Reweld	D-7
None	37 NRT A309	" "	"	"	" "	"	"	"	" "	D-8
None	37 NRT A311	RT-HAZ	"	"	" "	"	"	"		D-9
950F, 2 hrs	37 NRT A313	" "	"	"	" "	"	"	"	Single U edge Preparation	D-10
PH13-8Mo Preweld Condition: H 1000										11 to 15
Postweld:										
None	40 NRT C301	RT-Weld	4.0	.25	STW	RT	.08	60	Grindout Reweld	D-11
950F, 2 hrs	40 NRT C305	RT-Weld	"	"	"	"	"		" "	D-12
950F, 2 hrs	40 NRT C505	RT-HAZ	"	"	LHA	"	"	"		D-13
" "	40 NRT C506	" "	"	"	STW	"	"	"		D-14
" "	40 NRT C507	" "	"	"	STW	"	"	60		D-15

NOTE: All Figures Are For PTC Specimens, GTA Double U Type Butt Weld Joints, Unless Noted Differently In The Remarks Column.

APPENDIX D: INDEX OF FIGURES

Alloy and Condition	Figure No. (Specimen No.)	Crack Orientation and Location	"W" Nominal, Inches	"t" Inches	Environment	Test Temp	"R"	Freq. (cpm)	Remarks	Page No
PH13-8Mo Preweld: Condition A.										16 to 22
Postweld:										
1000F, 4 hrs	41 NRT C500	RT-HAZ	4.0	.25	Lab Air	-65	.08	360		D-16
" "	41 NRT C501	" "	"	"	LHA	RT	"	"		D-17
" "	41 NRT C502	" "	"	"	LHA	"	"	"		D-18
" "	41 NRW C550	RW-Weld	6.0	"	Lab Air	-65	"	"		D-19
" "	41 NRW C551	" "	"	"	LHA	RT	.3	"	CT Type, H/W=0.6	D-20
" "	41 NRW C552	" "	"	"	LHA	"	.08	"		D-21
" "	41 NRW C554	" "	"	"	STW	"	"	60		D-22
HP 9-4-.20 Preweld Condition: Heat Treated to 190-210 ksi UTS										23 to 40
Postweld:										
950F, 2 hrs	57 NRT A500	RT-HAZ	4.0	.50	LHA	RT	.08	60		D-23
" "	57 NRT A501	" "	"	"	"	-65	"	360		D-24
" "	57 NRT A502	" "	"	"	STW	RT	"	60		D-25
" "	57 NRT A506	" "	"	"	Dist.Water	"	.5	"		D-26
" "	57 NRT A508	" -BM	"	"	LHA	"	.08	"	Base Metal	D-27
" "	57 NRT A509	" -HAZ	"	"	"	-65	"	360		D-28
" "	57 NRT A510	" "	"	"	"	RT	.08	60		D-29
" "	57 NRT A514	" -Weld	"	"	"	-65	.08	"		D-30
" "	57 NRT A517	" -HAZ	"	.75	Dist Water	RT	"	"		D-31
" "	57 NRT A518	" "	"	.25	LHA	"	"	"		D-32
" "	57 NRT A519	" "	"	"	Dist Water	"	"	"		D-33
" "	57 NRW A550	RW-Weld	6.0	.50	LHA	"	.5	360		D-34
" "	57 NRW A551	" "	"	"	"	"	.3	"		D-35
" "	57 NRW A552	" "	"	"	"	"	.08	"		D-36
" "	57 NRW A553	" "	"	"	100% Hum	"	"	60	CT Type, H/W=0.6	D-37
" "	57 NRW A554	" "	"	"	LHA	"	"	360		D-38
" "	57 NRW A555	" "	"	"	"	"	"	60		D-39
" "	57 NRW A556	" "	"	"	100% Hum	"	"	"		D-40

NOTE: All Figures Are For PTC Specimens, GTA Double U Type Butt Weld Joints, Unless Noted Differently In The Remarks Column.

APPENDIX D: INDEX OF FIGURES

Alloy and Condition	Figure No. (Specimen No.)	Crack Orientation and Location	"W" Nominal, Inches	"t" Inches	Environment	Test Temp	"R"	Freq. (cpm)	Remarks	Page No
Ti-6Al-4V Preweld - MA Postweld-1100F,2 hrs	62 NRW 121-18-1 62 NRW 121-18-2 62 NRW 121-19-1	RW-Weld " " " "	6.0 " "	.50 " "	LHA " STW	RT " "	.08 " "	60 360 60	CT Type, H/W = 0.6	D-41 D-42 D-43
Ti-6Al-4V Preweld - RA Postweld-1100F,2 hrs	70 NRT B509	RT-Weld	4.0	.50	LHA	RT	.08	360		D-44
Ti-6Al-4V Preweld - MA (β extruded) Postweld-1100F,2 hrs	75 NRT B515 75 NRT B516 75 NRT B517 75 NRT B533	RT-HAZ " " " " " -Weld	4.0 " " "	.50 " " "	LHA " STW LHA	RT -65 RT "	.08 " " "	360 " 60 360		D-45 D-46 D-47 D-48
Ti-6Al-4V Preweld - RA Postweld-1200F,1 hr	76 NRT B518 76 NRT B519	RT-HAZ " "	4.0 "	.75 "	LHA STW	RT "	.08 "	60 "		D-49 D-50
Ti-6Al-4V Preweld - MA Postweld-1100F,2 hrs	80 NRW B522 80 NRW B523	RW-HAZ " "	24.0 "	.10 "	LHA STW	RT "	.08 "	60 "	CCT Type, Square Edge Preparation	D-51 D-52

NOTE: All Figures Are For PTC Specimens, GTA Double U Type Butt Weld Joints, Unless Noted Differently In The Remarks Column.

APPENDIX D: INDEX OF FIGURES

Alloy and Condition	Figure No. (Specimen No.)	Crack Orientation and Location	"W" Nominal, Inches	"t" Inches	Environment	Test Temp	"R"	Freq. (cpm)	Remarks	Page No
Ti-6Al-4V Preweld-RA Postweld-1100F,2 hrs	87 NRT B500	RT-HAZ	4.0	.50	LHA	RT	.08	360		D-53
Ti-6Al-4V Preweld: RA Postweld:										
1100F, 2 hrs	88 NRT B300	RT-Weld	4.0	.50	LHA	RT	.08	360	Weld Overlay	D-54
" "	88 NRT B303	" "	"	"	STW	"	"	60	Grindout Reweld	D-55
None	88 NRT B304	" "	"	"	"	"	"	60	" "	D-56
1100F, 2 hrs	88 NRT B514	" -HAZ	"	"	"	"	"	"	Single U Edge Preparation	D-57
" "	88 NRT B503	" "	"	"	LHA	"	.3	360		D-58
" "	88 NRT B504	" "	"	"	STW	"	.08	60		D-59
" "	88 NRT B505	" "	"	"	LHA	-65	"	360		D-60
" "	88 NRT B506	" "	"	"	STW	RT	"	60		D-61
" "	88 NRT B507	" "	"	"	"	"	.3	"		D-62
" "	88 NRT B508	" "	"	"	SCS	"	.08	"		D-63
" "	88 NRT B510	RT-Weld	"	"	STW	"	"	360		D-64
" "	88 NRT B520	RT-HAZ	"	.25	LHA	"	"	60		D-65
" "	88 NRT B524	" "	"	.50	"	"	"	360		D-66
" "	88 NRT B525	" "	"	"	"	"	"	60		D-67
" "	88 NRT B526	" "	"	"	Freon TF	"	"	"		D-68
" "	88 NRT B527	" "	"	"	LHA	"	"	360		D-69
" "	88 NRT B528	" "	"	"	"	"	"	"		D-70
" "	88 NRT B530	RT-Weld	"	"	"	"	"	"	Plasma Arc Weld	D-71
" "	88 NRT B531	RT-Haz	"	"	"	"	"	"	Square Butt Edge	D-72
" "	88 NRT B532	" "	"	"	STW	"	"	"	Preparation	D-73

NOTE: All Figures Are For PTC Specimens, GTA Double U Type Butt Weld Joints, Unless Noted Differently In The Remarks Column.

APPENDIX D: INDEX OF FIGURES

Alloy and Condition	Figure No. (Specimen No.)	Crack Orientation and Location	"W" Nominal, Inches	"t" Inches	Environment	Test Temp	"R"	Freq. (cpm)	Remarks	Page No
Ti-6Al-4V Preweld: RA Postweld: (Cont'd)										
1200F, 1 hr	88 NRT B535	RT-HAZ	4.0	.50	LHA	RT	.08	360		D-74
" "	88 NRT B536	RT-Weld	"	"	STW	"	"	60		D-75
" "	88 NRT B537	RT-HAZ	"	"	"	"	"	"		D-76
" "	88 NRT B538	" "	"	"	LHA	"	"	360		D-77
1400F, 1 hr	88 NRT B539	" "	"	"	STW	"	"	60		D-78
" "	88 NRT B540	" "	"	"	LHA	"	"	360		D-79
1100F, 2 hrs	88 NRW B550	RW-Weld	6.0	"	STW	"	"	60	CT Type,	D-80
" "	88 NRW B551	" "	"	"	LHA	-65	"	360	H/W = 0.6	D-81
Ti-6Al-4V Preweld - RA Postweld-1100F,2 hr	89 NRT B502	RT-HAZ	4.0	.50	LHA	RT	.08	360		D-82

NOTE: All Figures Are For PTC Specimens, GTA Double U Type Butt Weld Joints, Unless Noted Differently In The Remarks Column

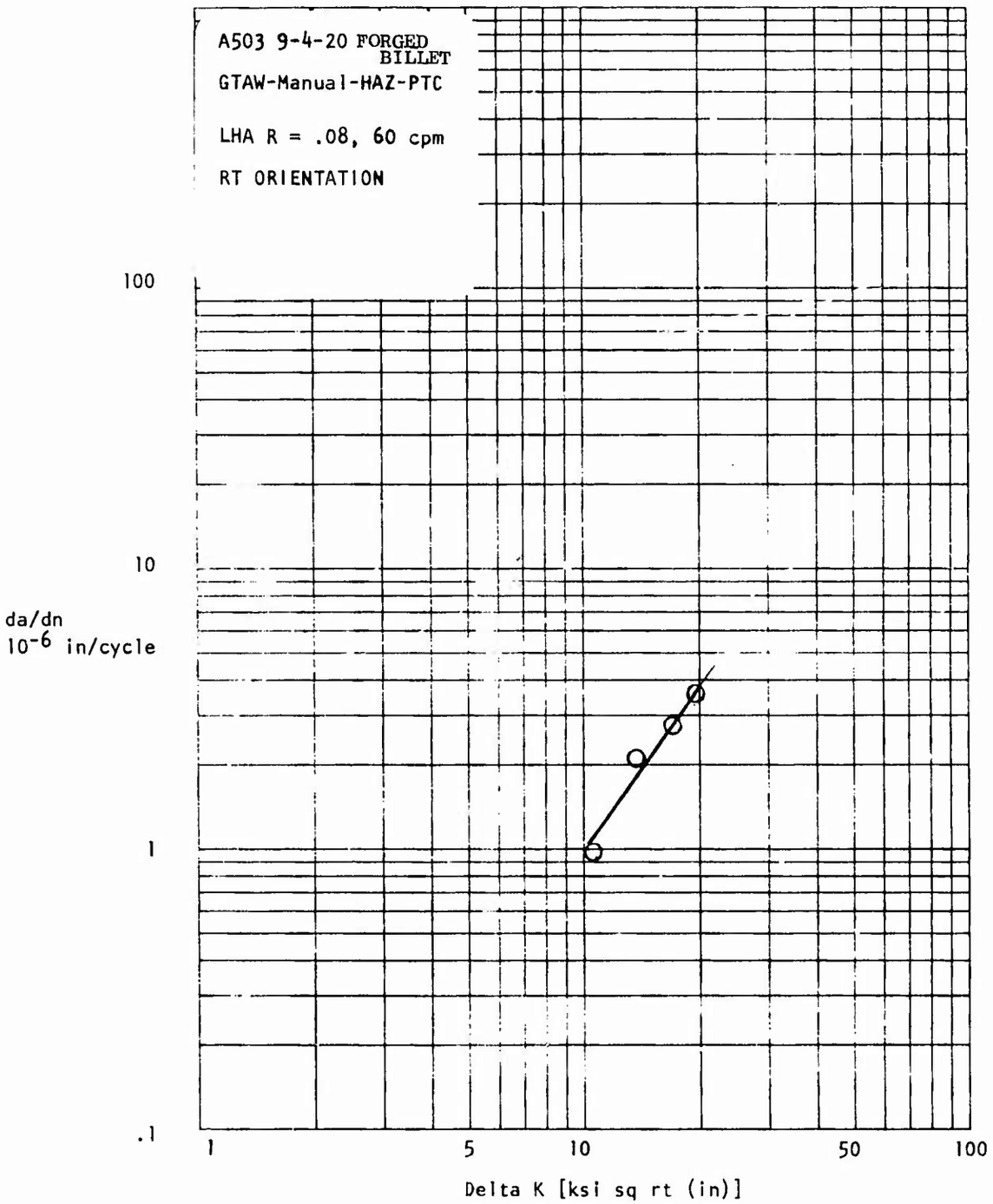


Figure 33 NRT A503 Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in LHA

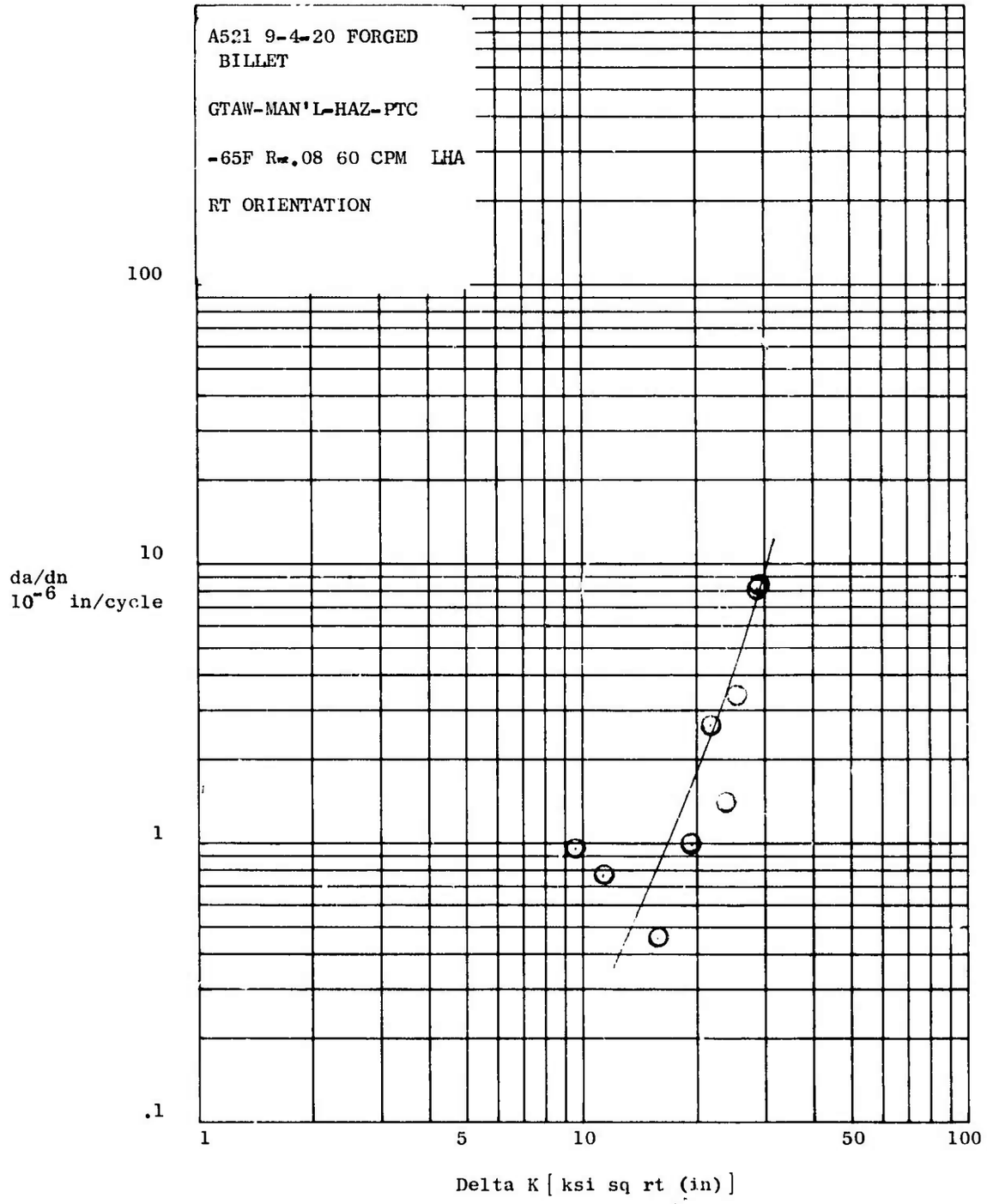


Figure 33 NRT A521 Fatigue Crack Growth Rate at -65F in the HAZ of a Welded 9-4-20 Forged Billet PTC Specimen.

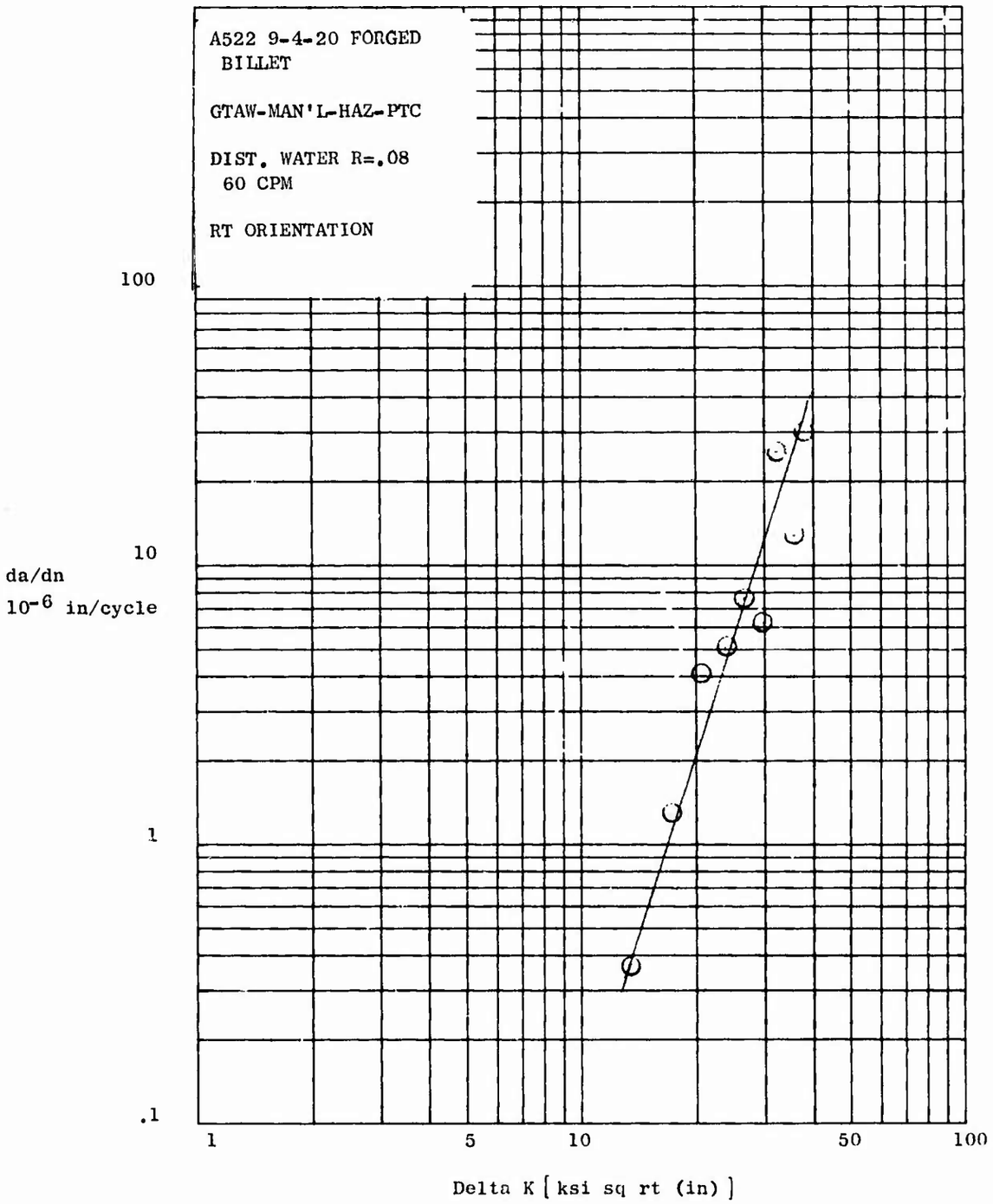


Figure 33 NRT A522 Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Forged Billet PTC Specimen.

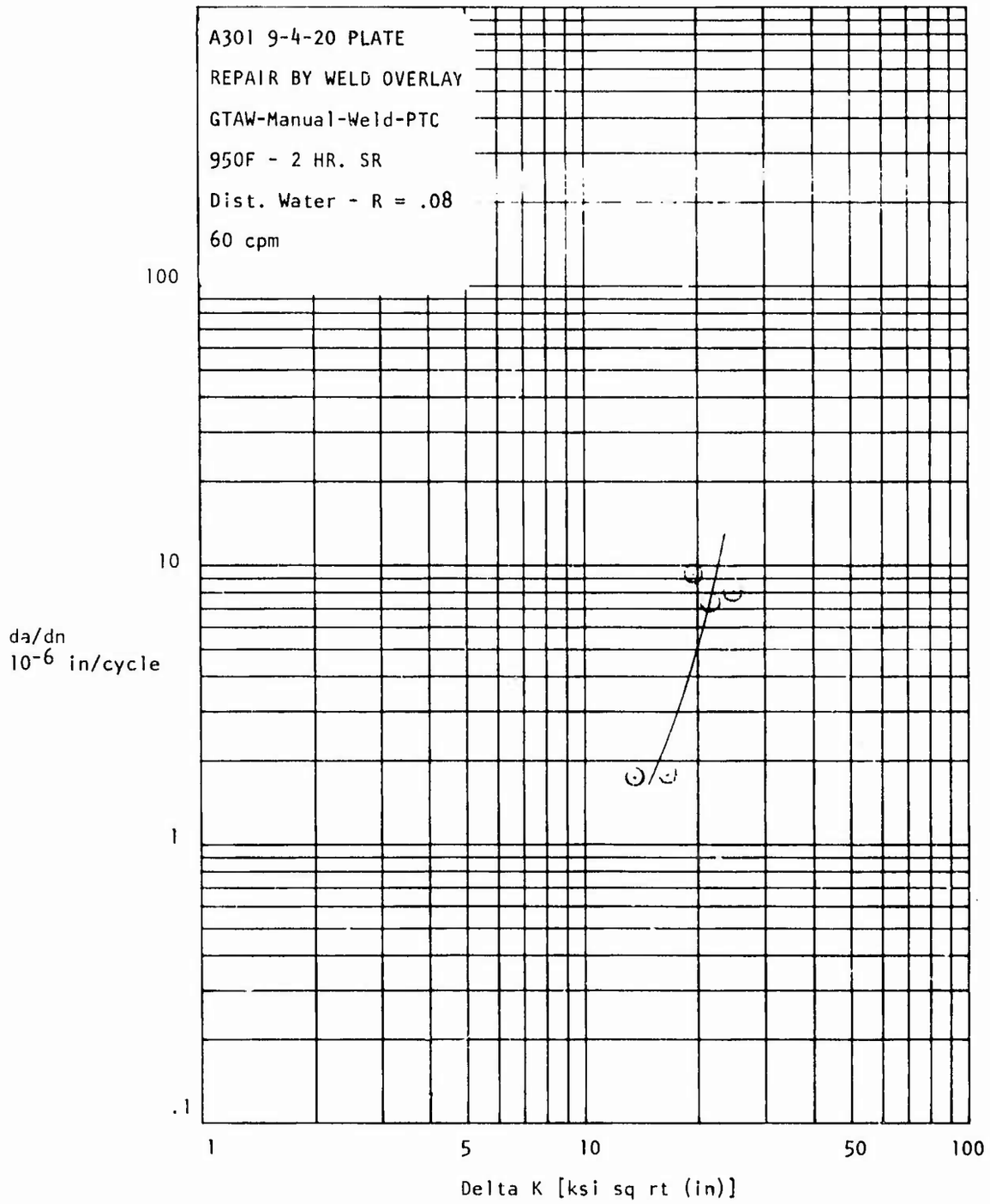


Figure 37 NRT A301 Fatigue Crack Growth Rate in the Overlay Repair Weld on a Stress Relieved 9-4-20 Plate PTC Specimen

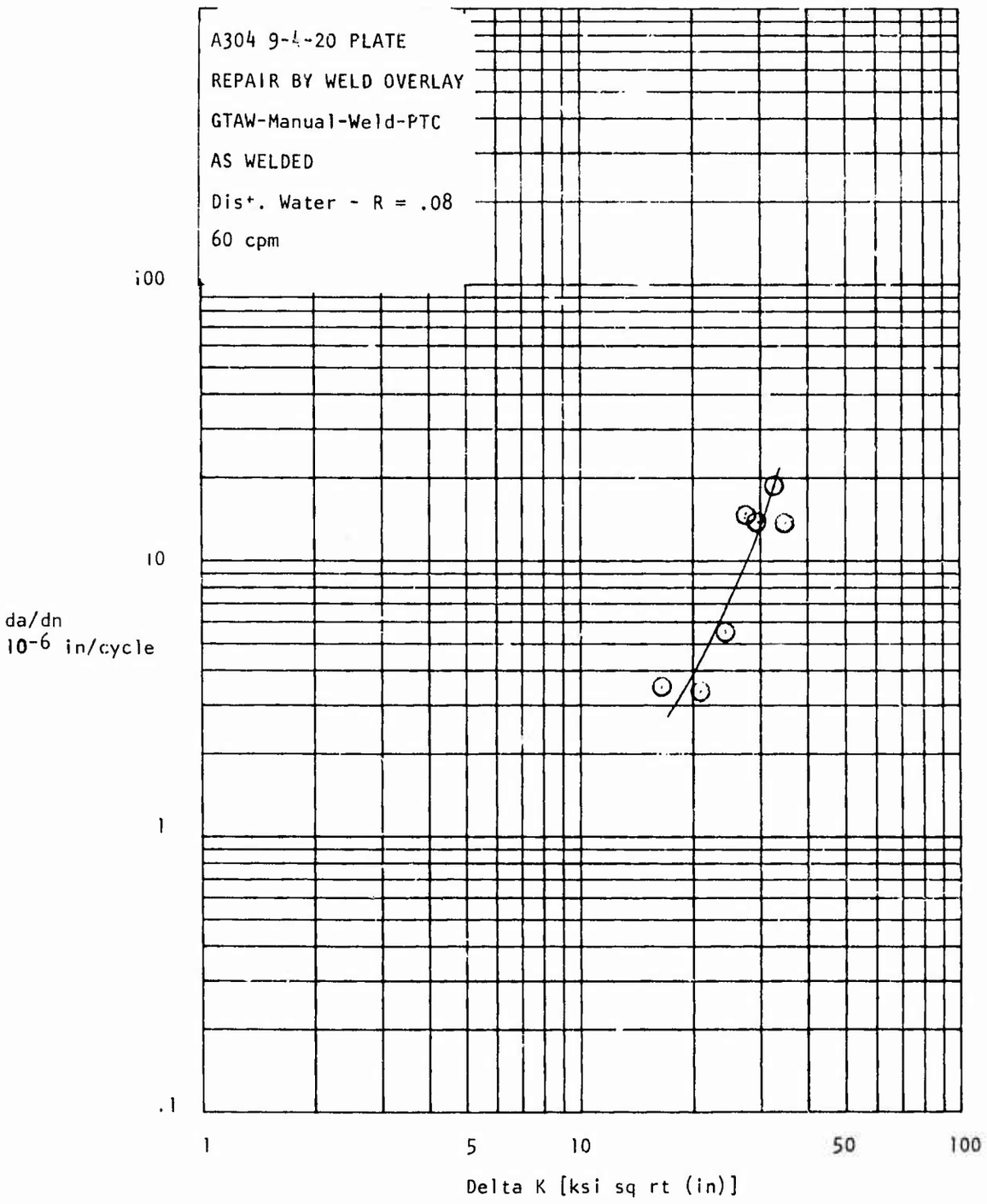


Figure 37 NRT A304 Fatigue Crack Growth Rate in the Overlay Repair Weld on an As-Welded 9-4-20 Plate PTC Specimen

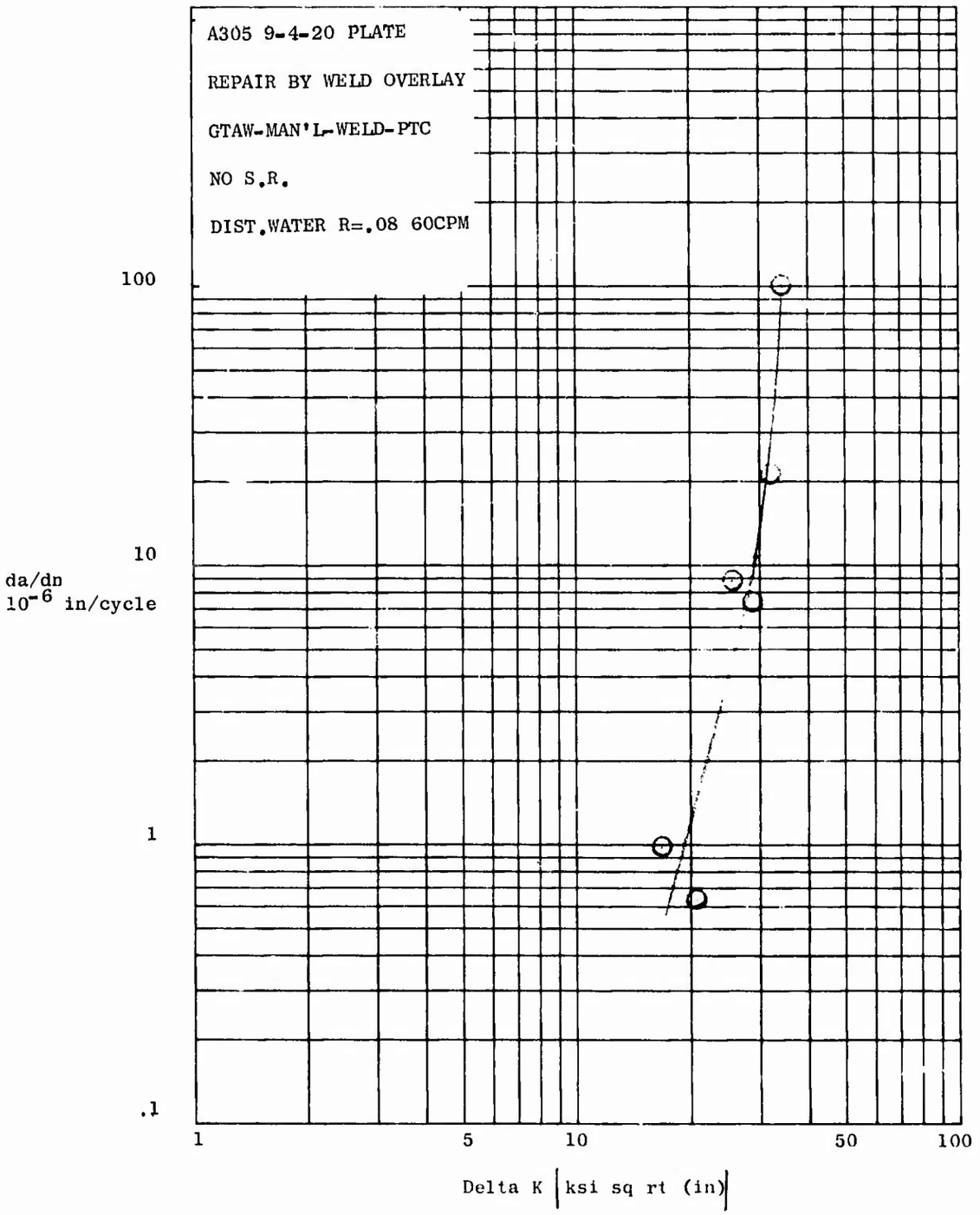


Figure 37 NRT A305 Fatigue Crack Growth Rate in the Overlay Repair Weld on a Non-Stress Relieved 9-4-20 Plate-PTC Specimen.

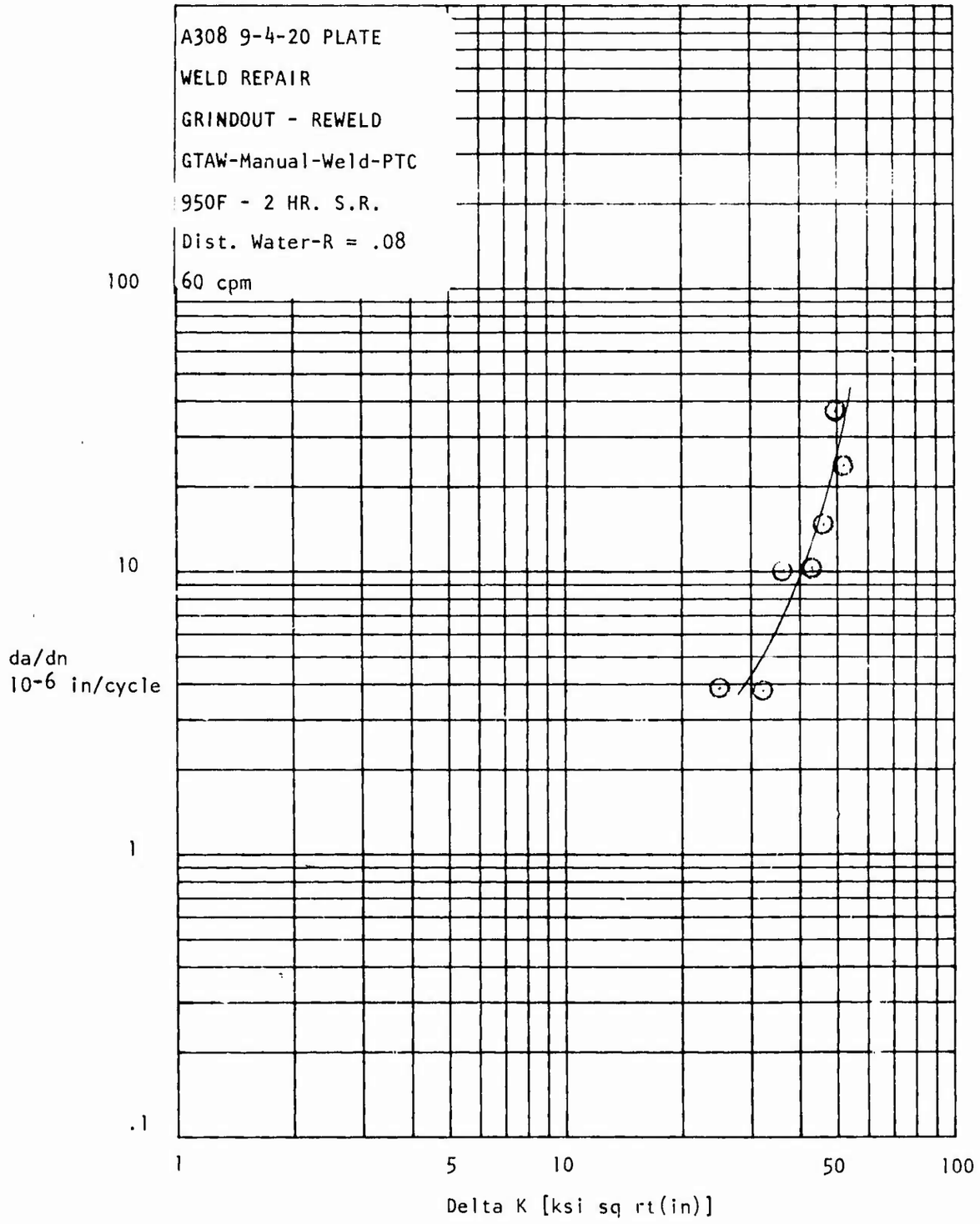


Figure 37 NRT A308 Fatigue Crack Growth Rate in the Weld of a Rewelded Stress Relieved 9-4-20 Plate PTC Specimen

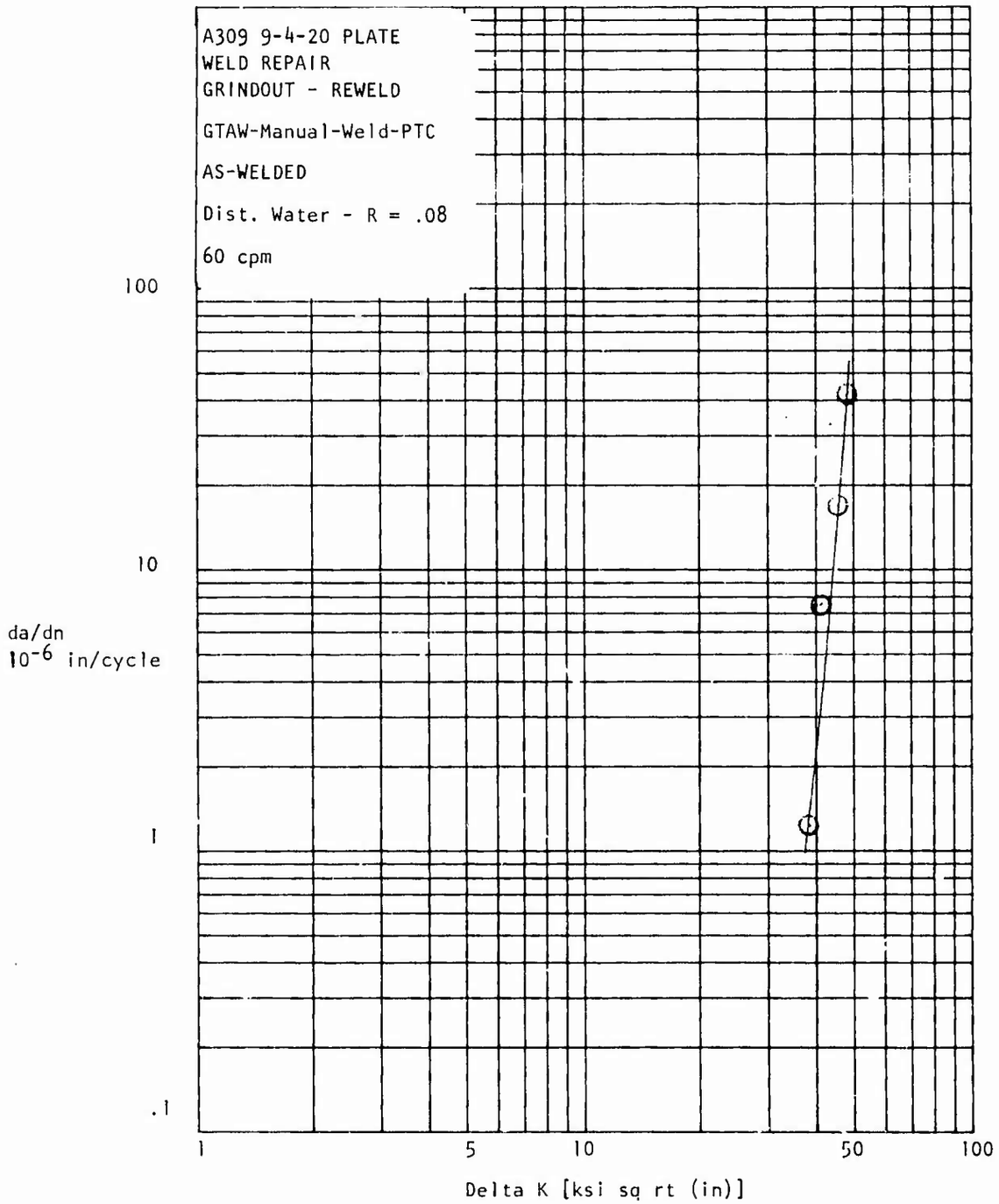


Figure 37 NRT A309 Fatigue Crack Growth Rate in the Weld of a Rewelded 9-4-20 Plate PTC Specimen with no Stress Relief

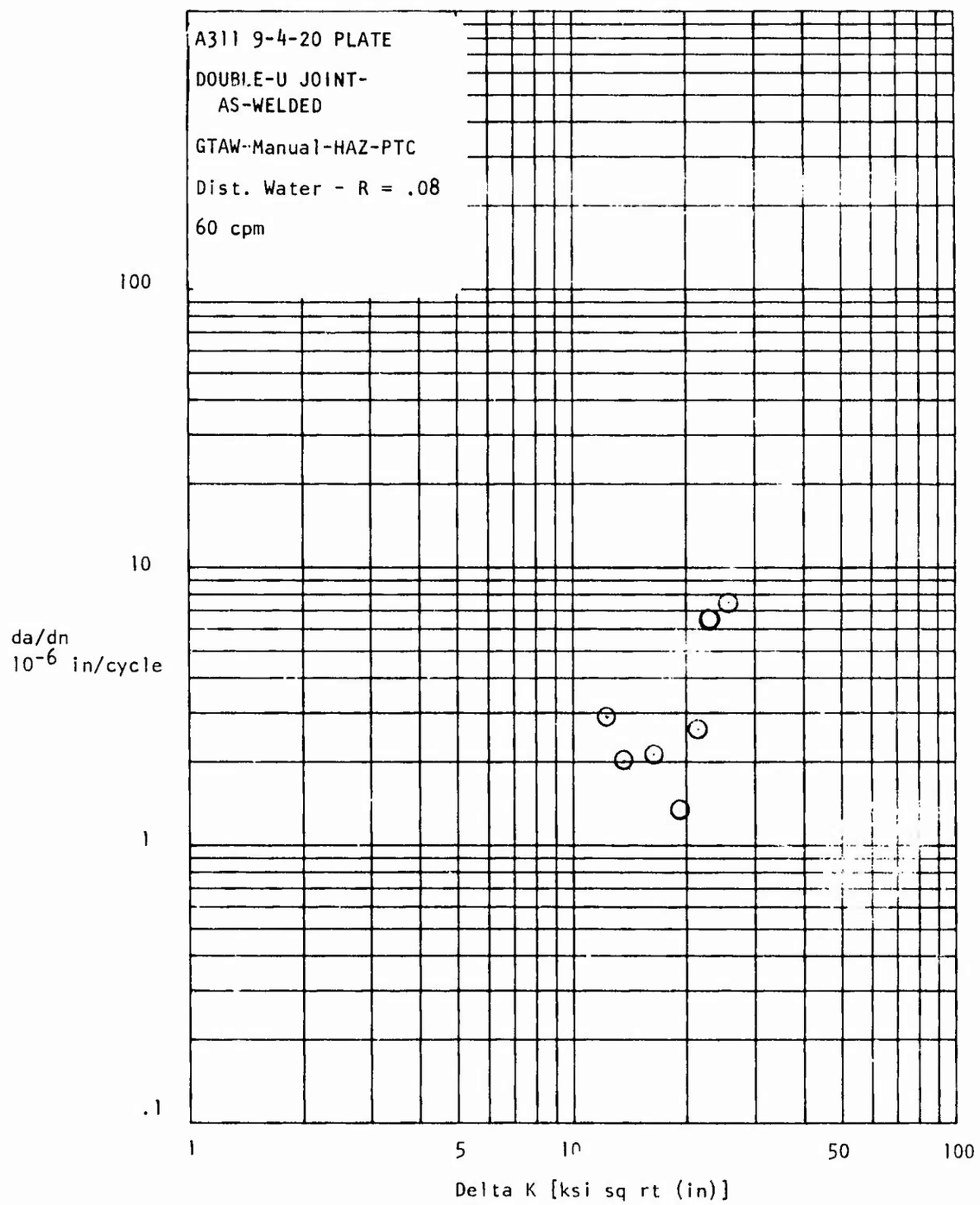


Figure 37 NRT A311 Fatigue Crack Growth Rate in the HAZ on an As-Welded 9-4-20 Plate PTC Specimen

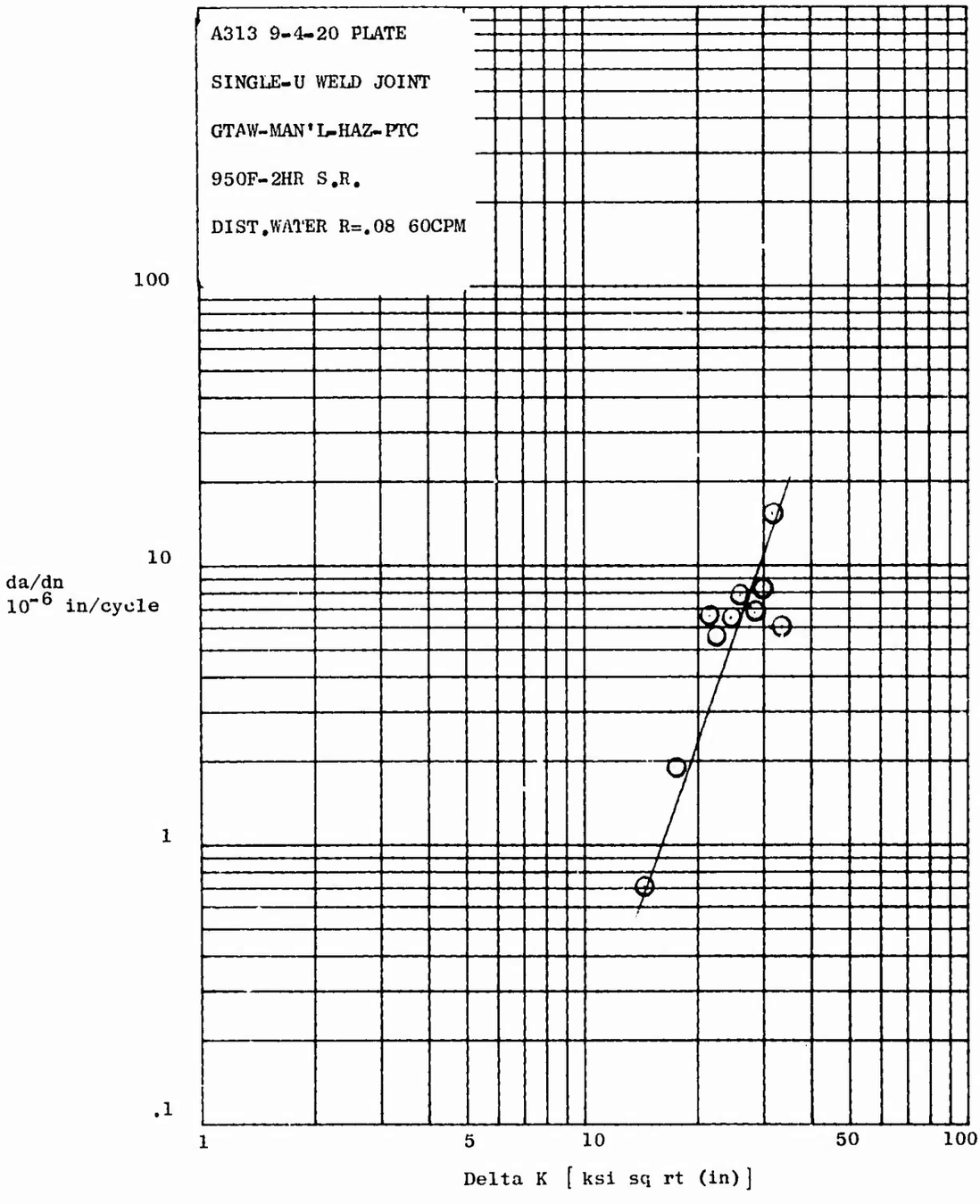


Figure 37 NRT A313 Fatigue Crack Growth Rate in the HAZ of a Single-U Weld Joint in 9-4-20 Plate PTC Specimen.

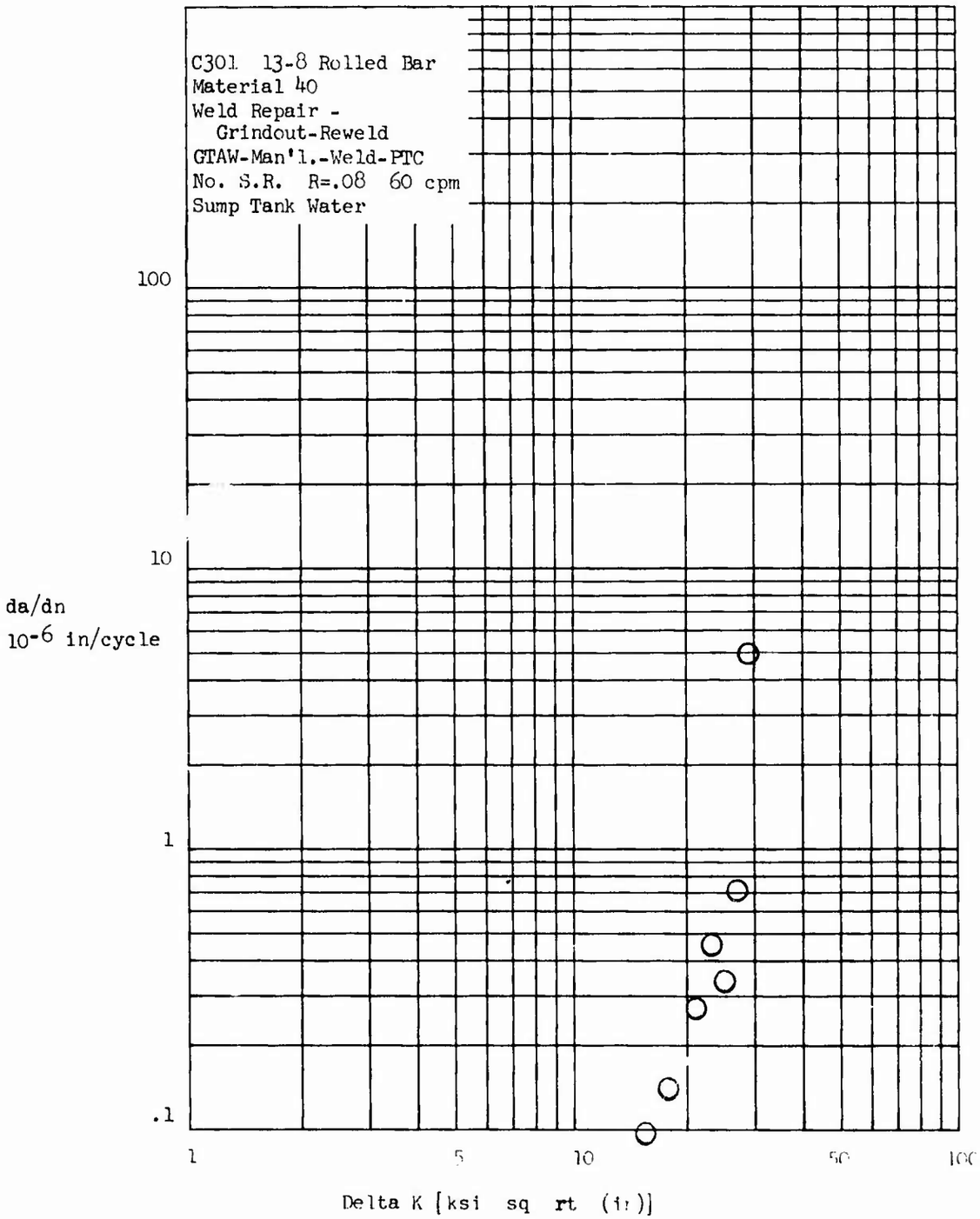


Figure 40 NRT C301 Fatigue Crack Growth Rate in the Weld of a Rewelded Non-Stress Relieved 13-8 Rolled Bar PTC Specimen.

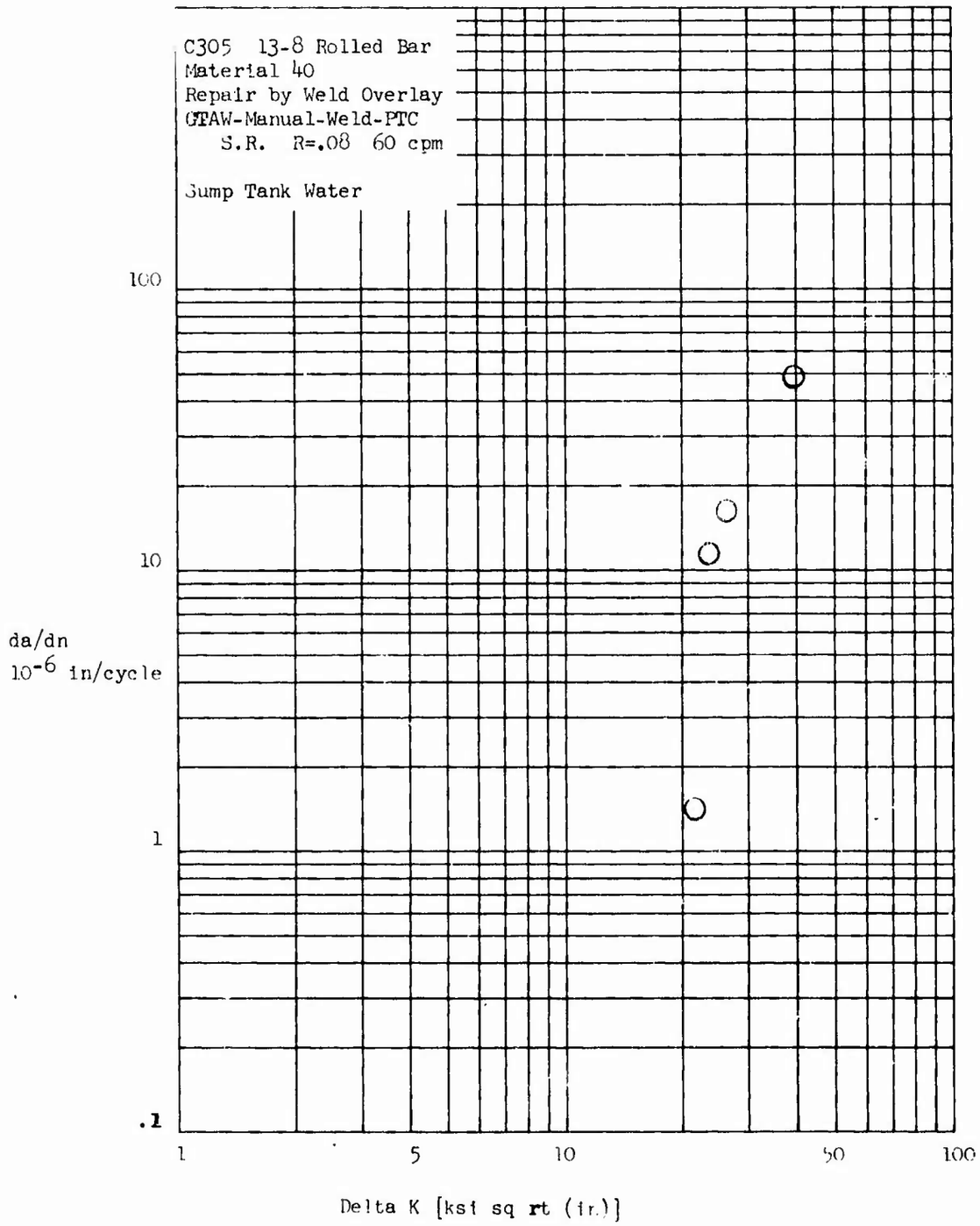


Figure 40 NRT C305 Fatigue Crack Growth Rate in the Overlay Repair Weld on a Stress-Relieved 13-8 Rolled Bar PTC Specimen

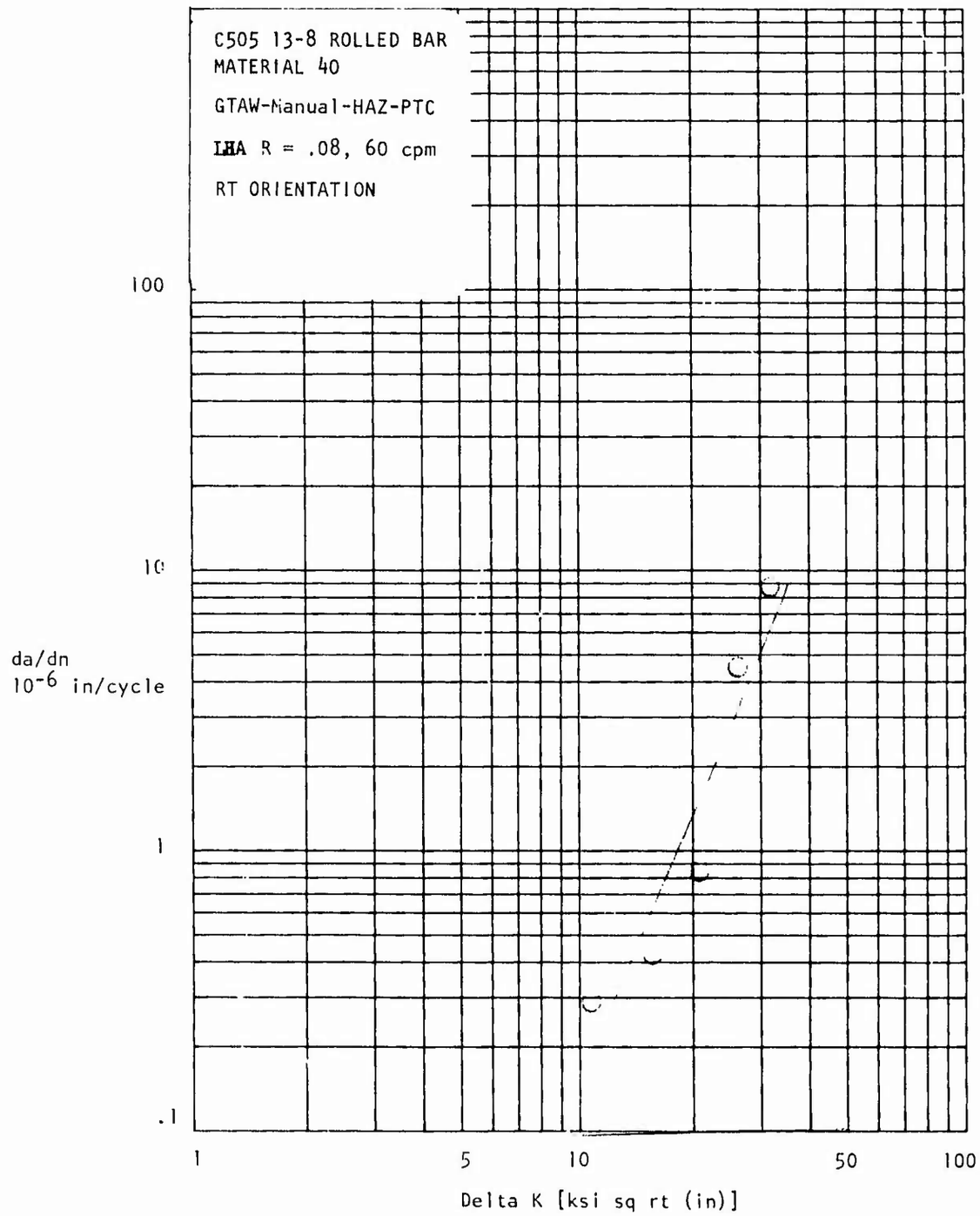


Figure 40 NRT C505 Fatigue Crack Growth Rate in the HAZ of a Welded 13-8 Rolled Bar PTC Specimen in LHA

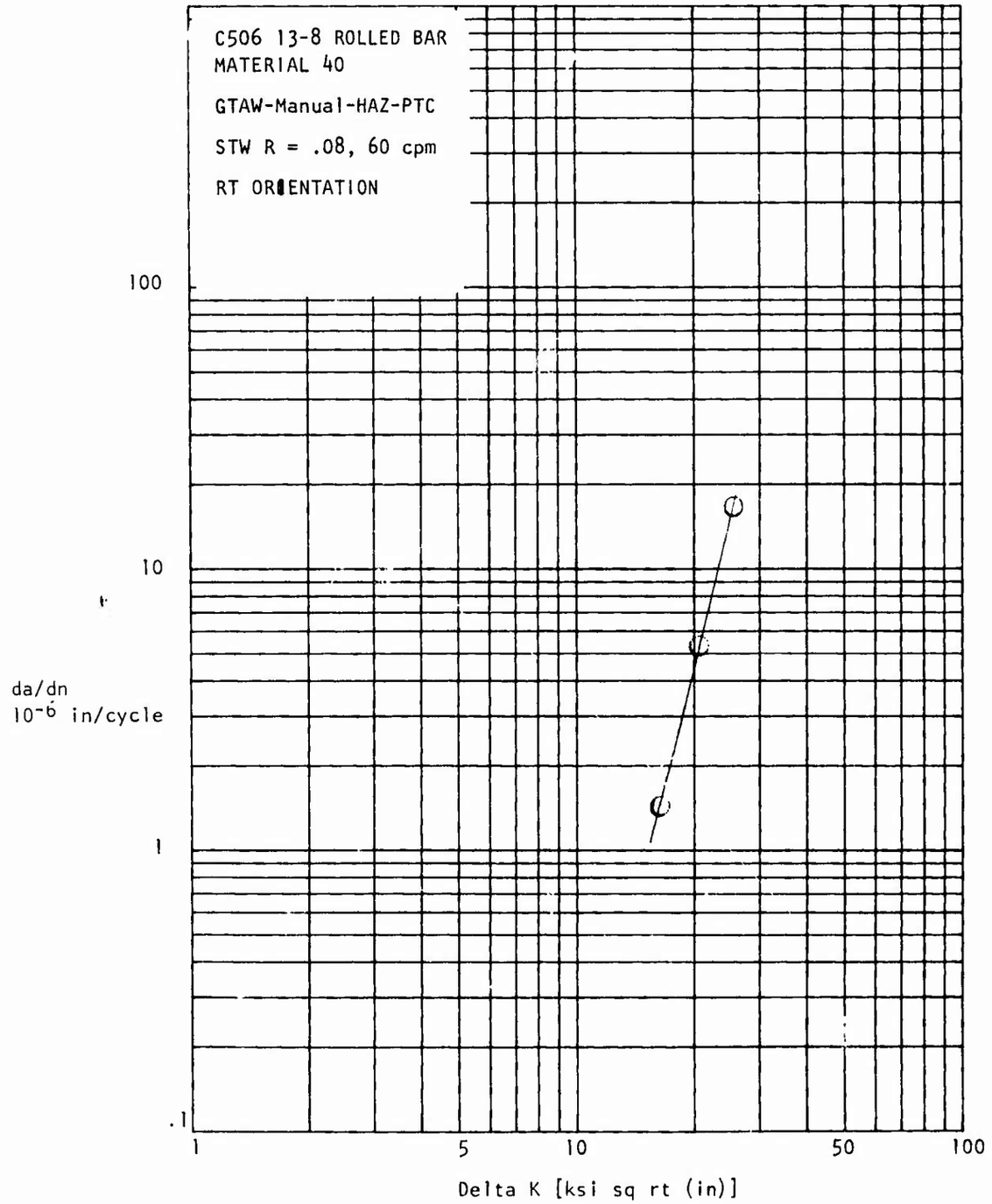


Figure 40 NRT C506 Fatigue Crack Growth Rate in the HAZ of a Welded 13-8 Rolled Bar PTC Specimen in STW

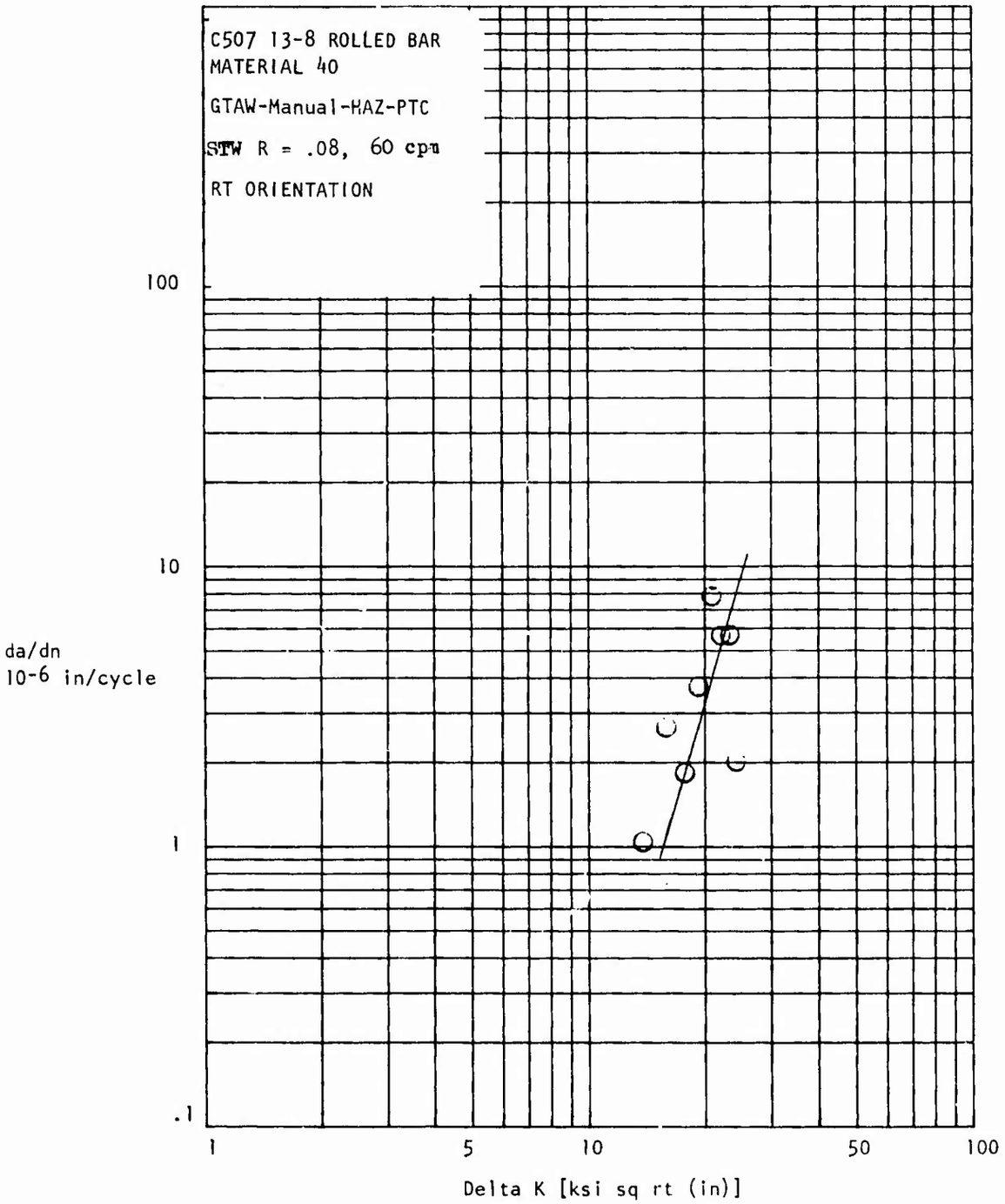


Figure 40 NRT C507 Fatigue Crack Growth Rate in the HAZ of a Welded 13-8 Rolled Bar PTC Specimen in STW

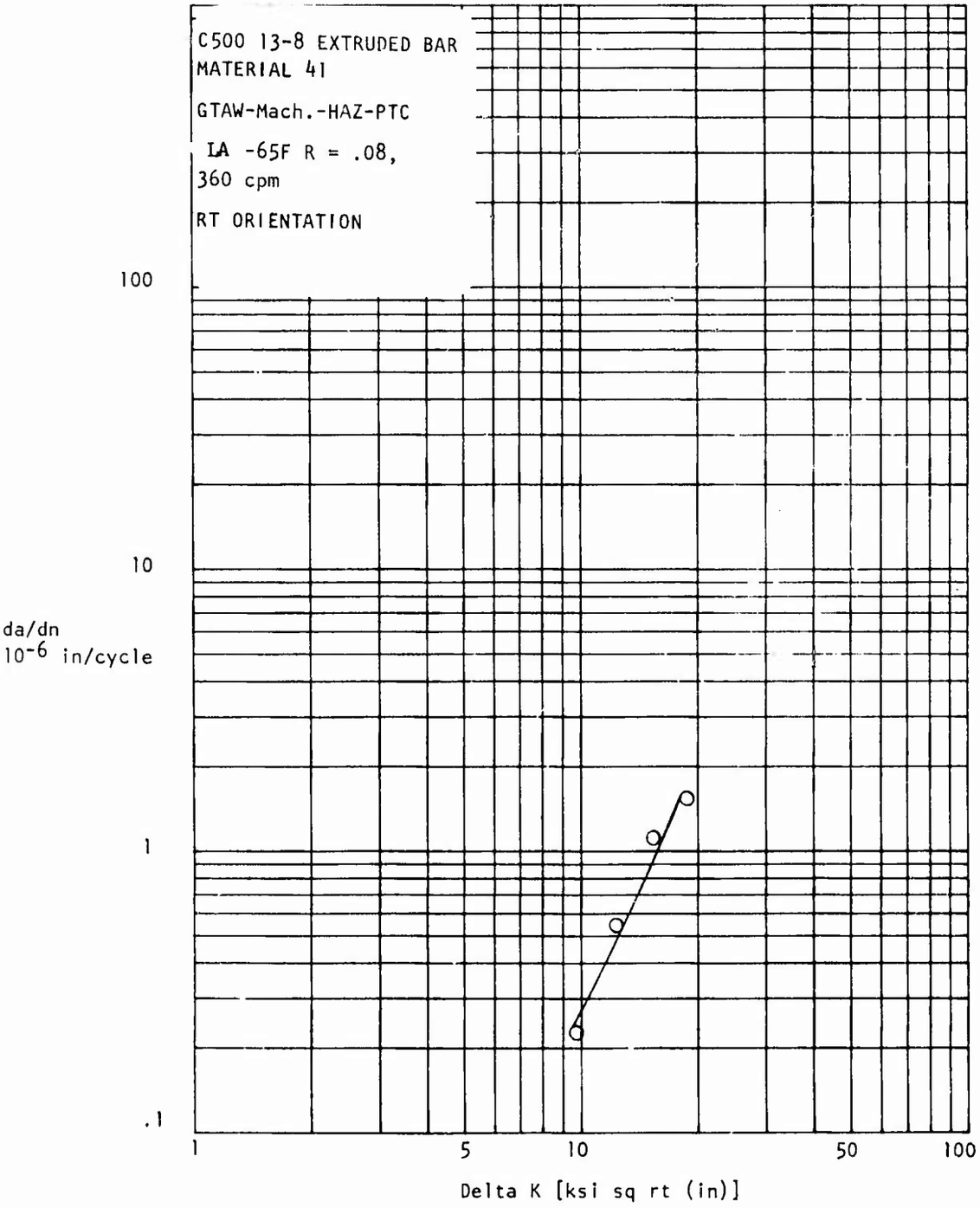


Figure 41 NRT C500 Fatigue Crack Growth Rate in the HAZ of a Welded 13-8 Extruded Bar PTC Specimen in LA at -65F

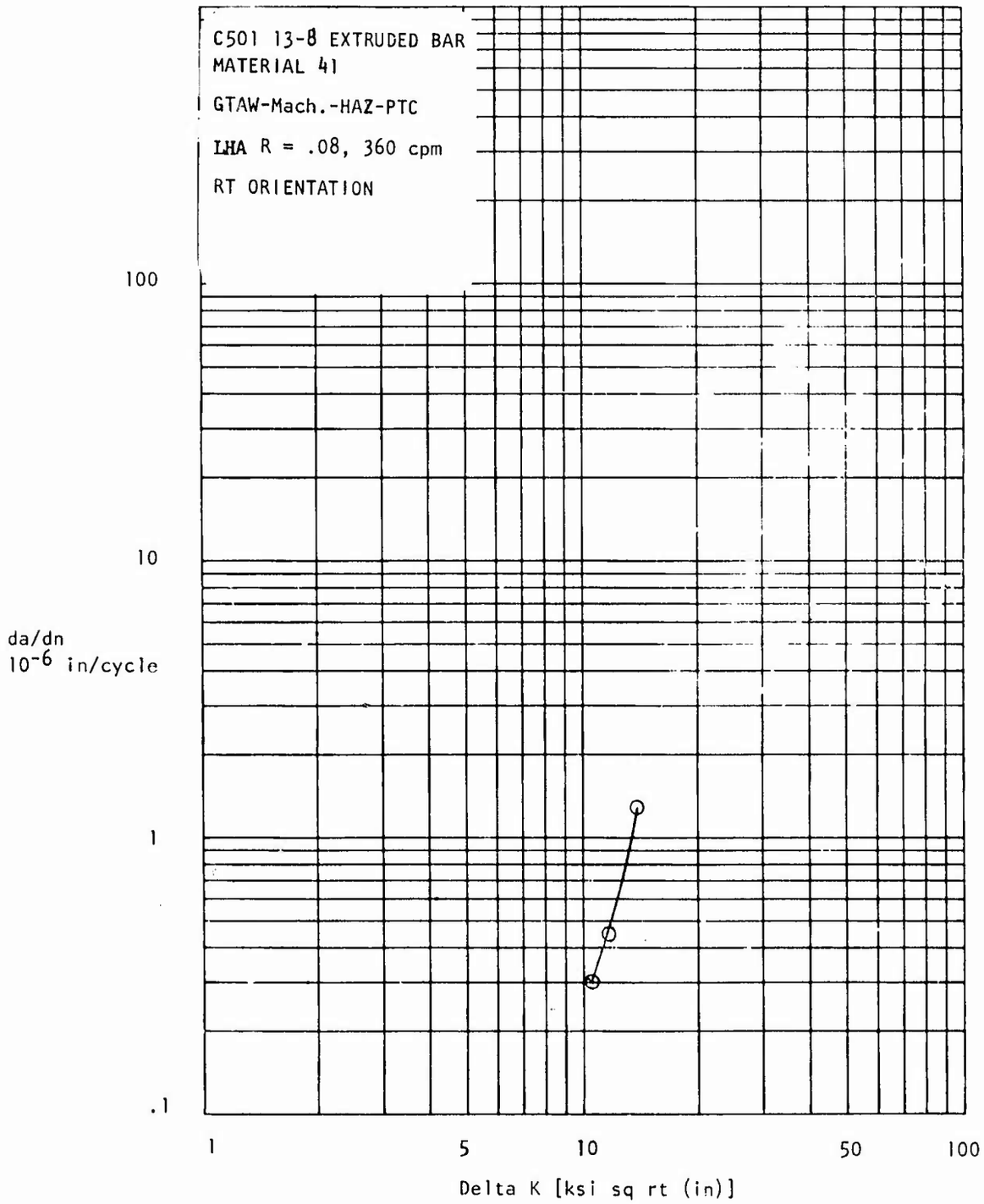


Figure 41 NRT C501 Fatigue Crack Growth Rate in the HAZ of a Welded 13-8 Extruded Bar PTC Specimen in LHA

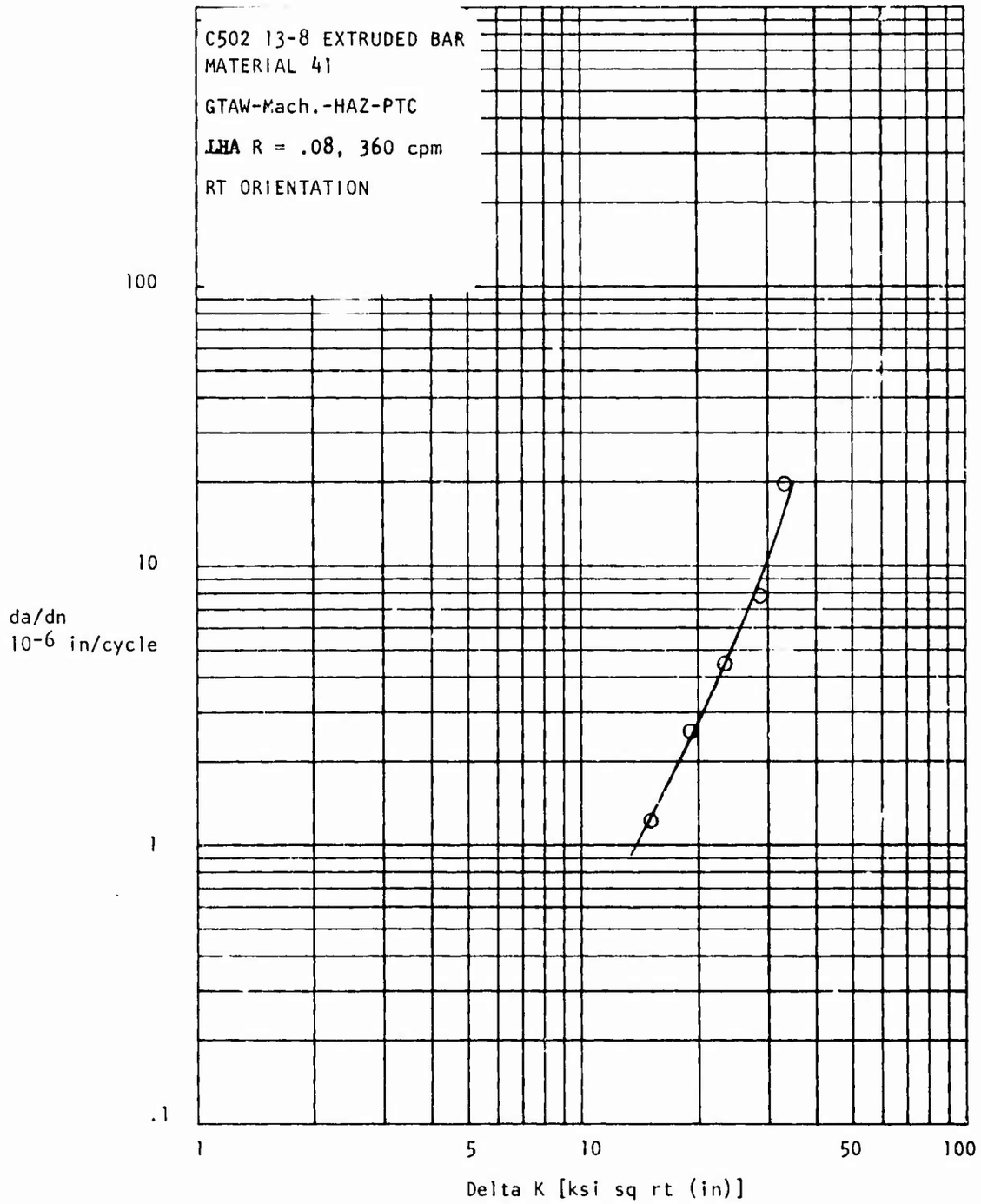


Figure 41 NRT C502 Fatigue Crack Growth Rate in the HAZ of a Welded 13-8 Extruded Bar PTC Specimen in LHA

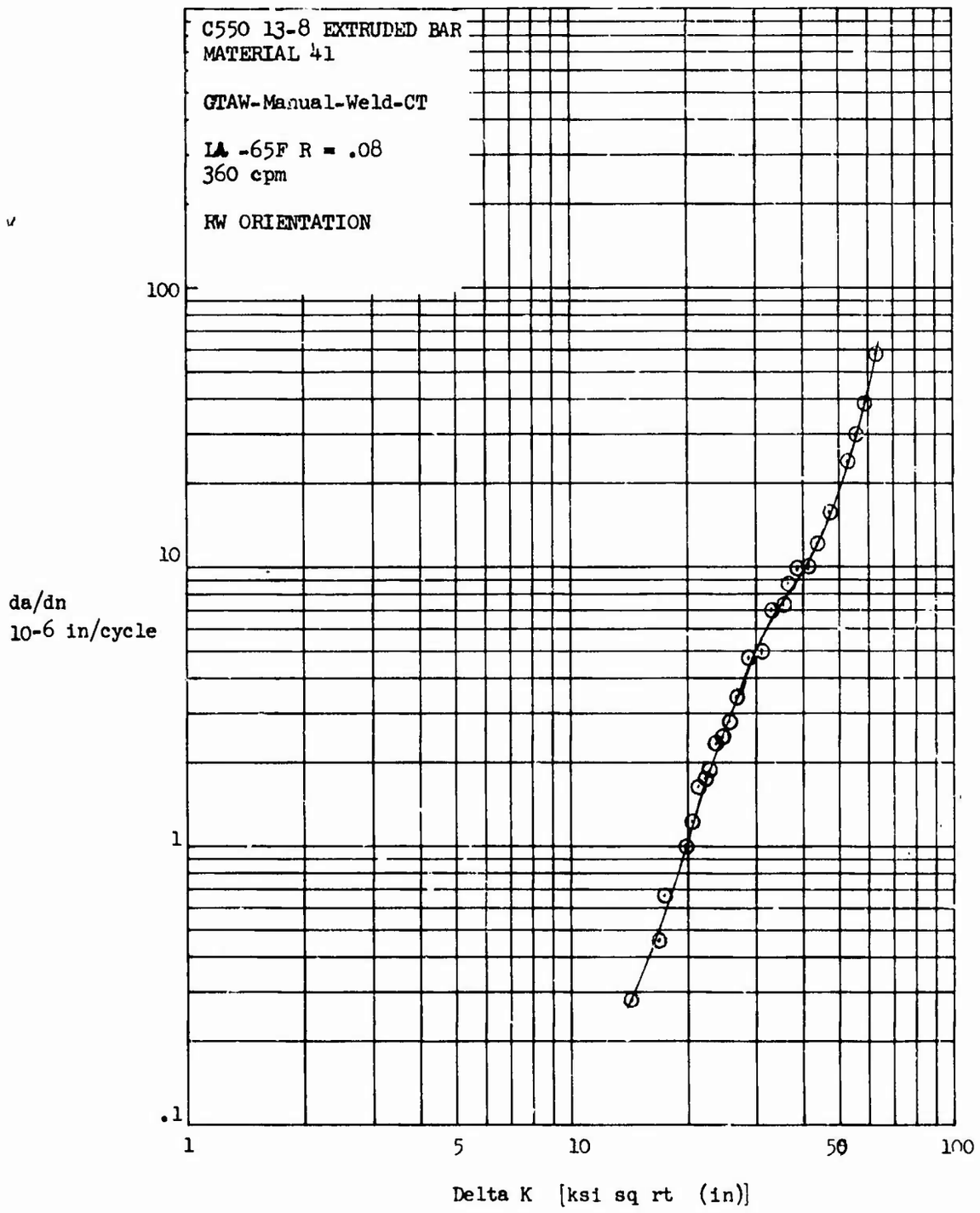


Figure 41 NRW C550 Fatigue Crack Growth Rate in the Weld Metal of Welded 13-8 Extruded Bar CT Specimen in LA at -65F

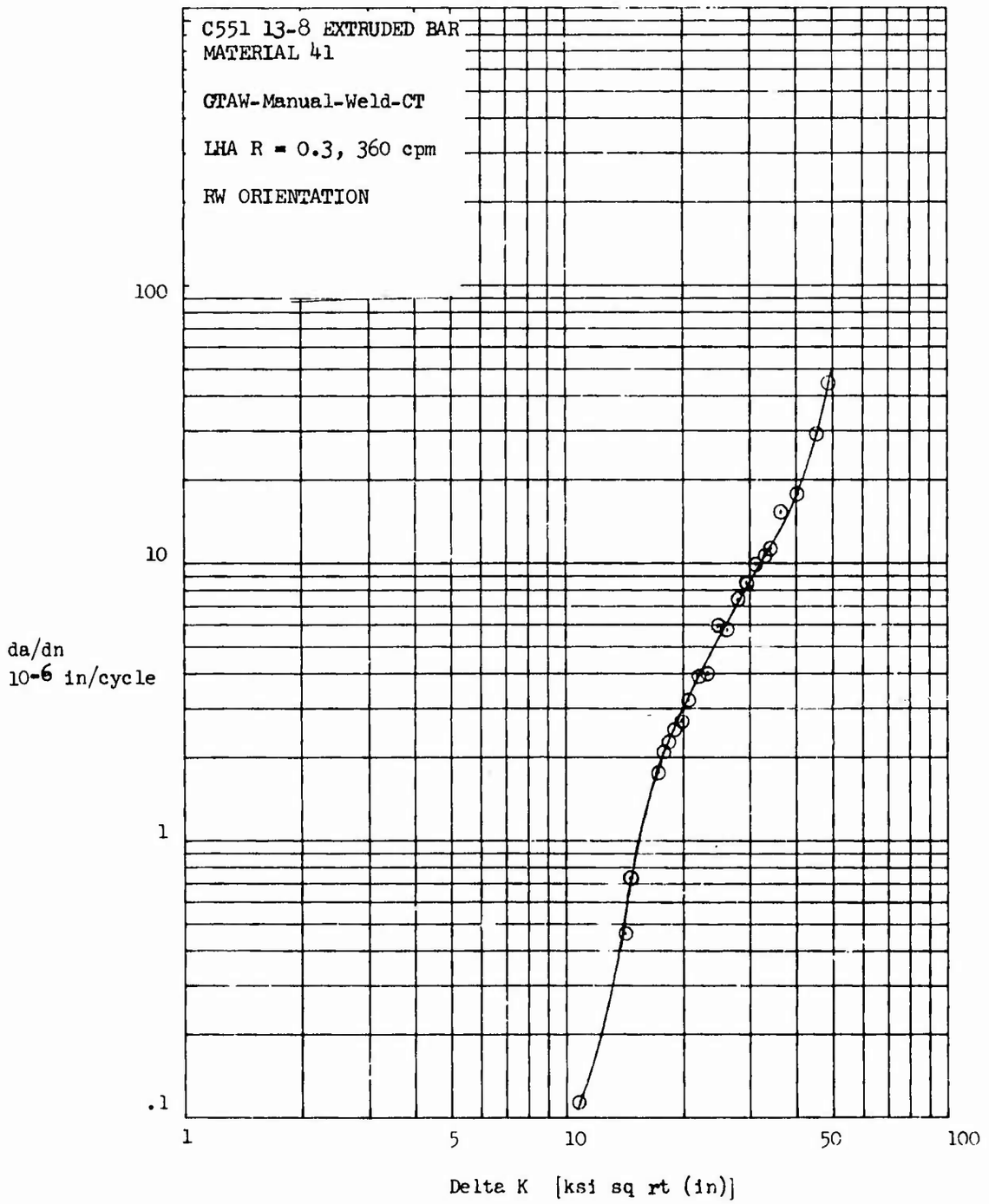


Figure 41 NRW C551 Fatigue Crack Growth Rate in the Weld Metal of Welded 13-8 Extruded Bar CT Specimen in LHA

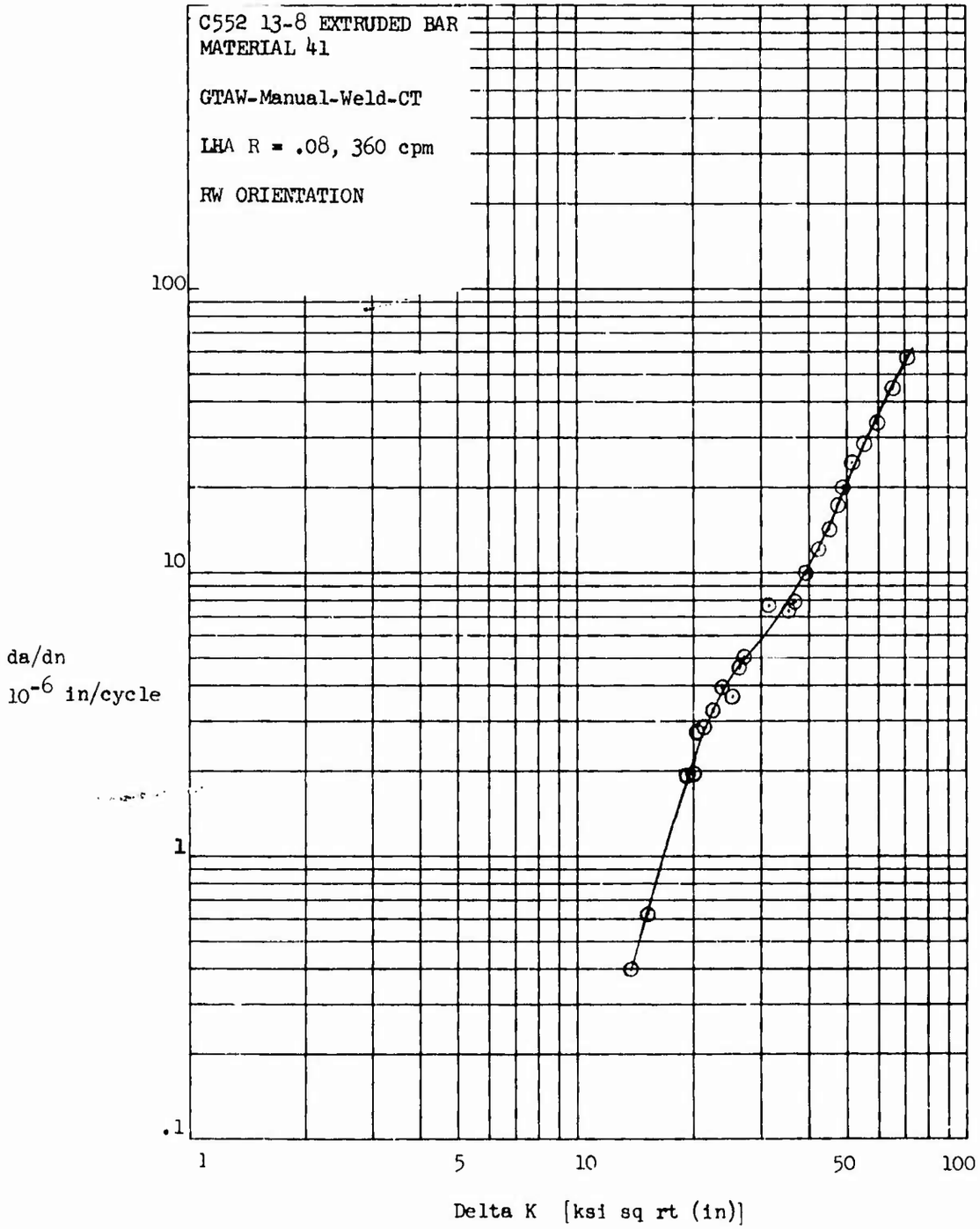


Figure 41 NRW C552 Fatigue Crack Growth Rate in the Weld Metal of a Welded 13-8 Extruded Bar CT Specimen in LHA

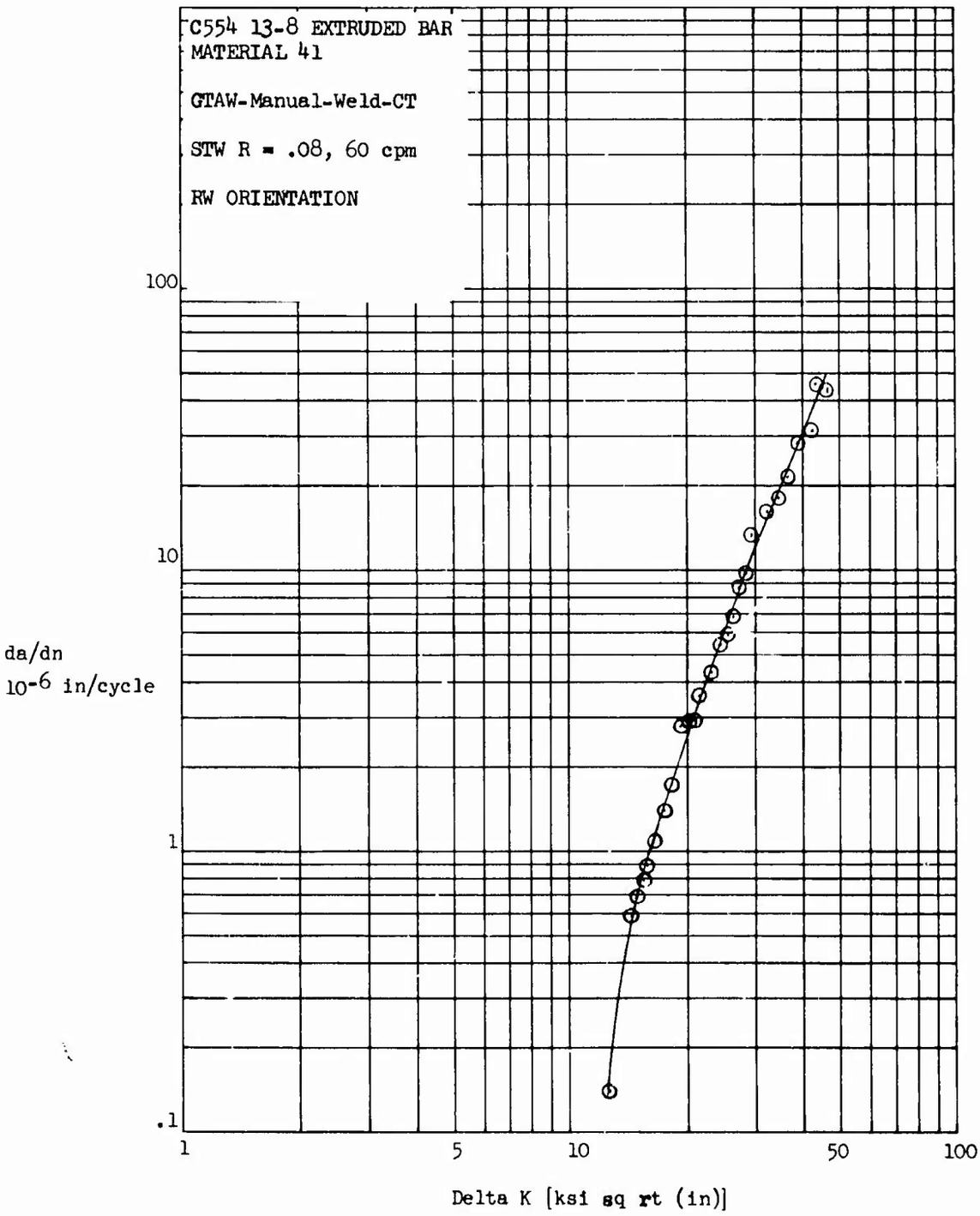


Figure 41 NRW C554 Fatigue Crack Growth Rate in the Weld Metal of a Welded 13-8 Extruded Bar CT Specimen in STW

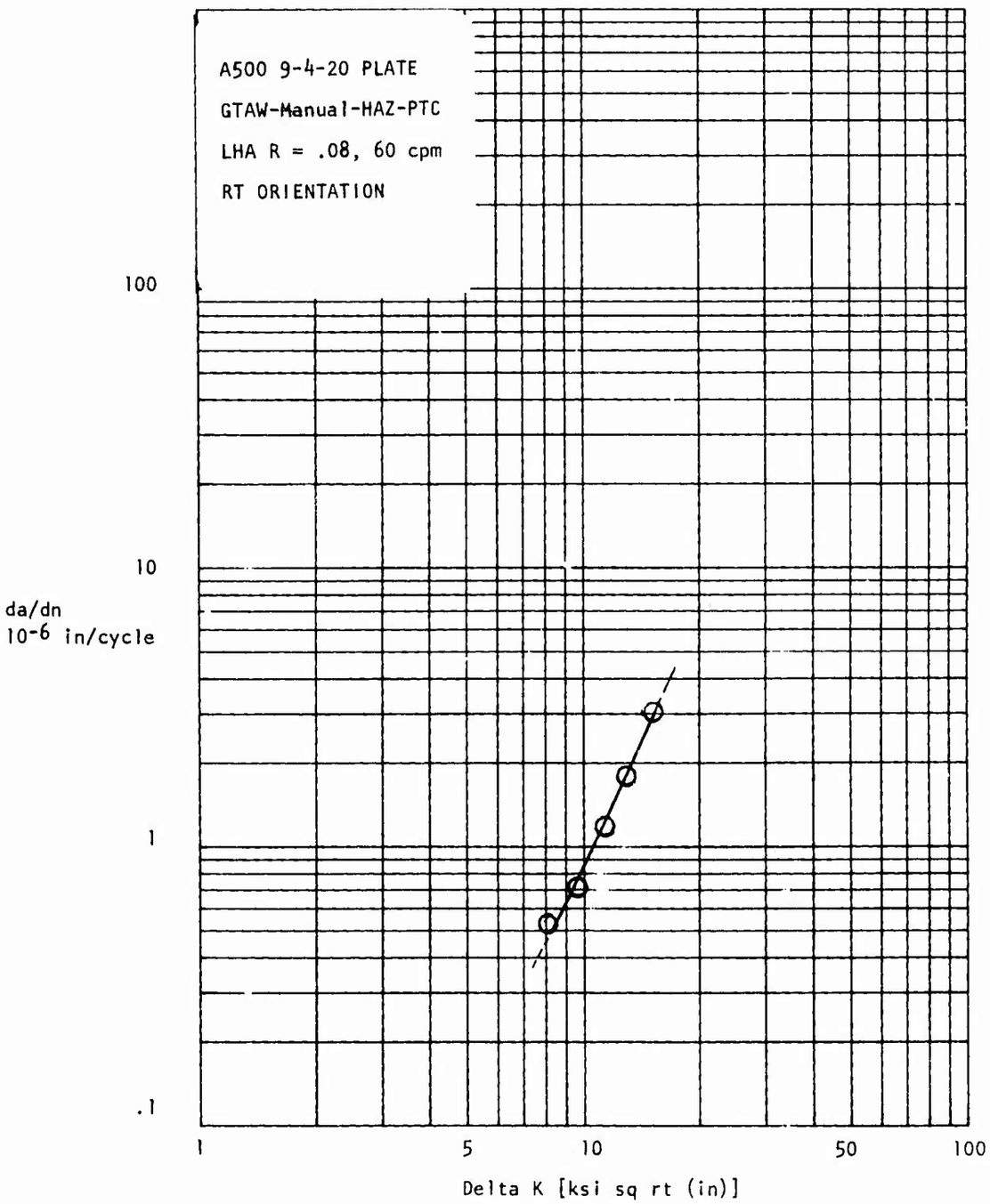


Figure 57 NRT A500 Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in LHA

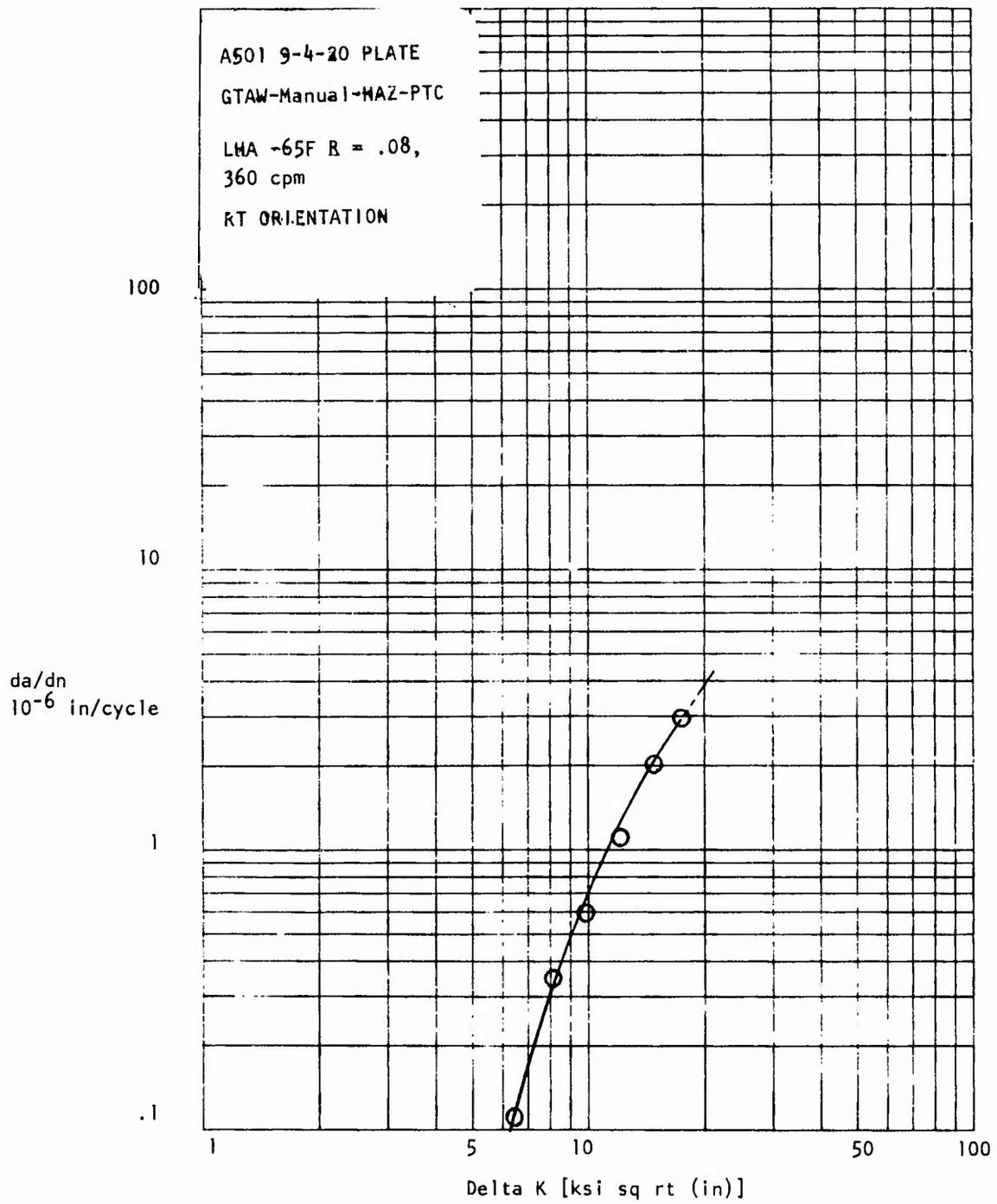


Figure 57 NRT A501 Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in LHA at -65F

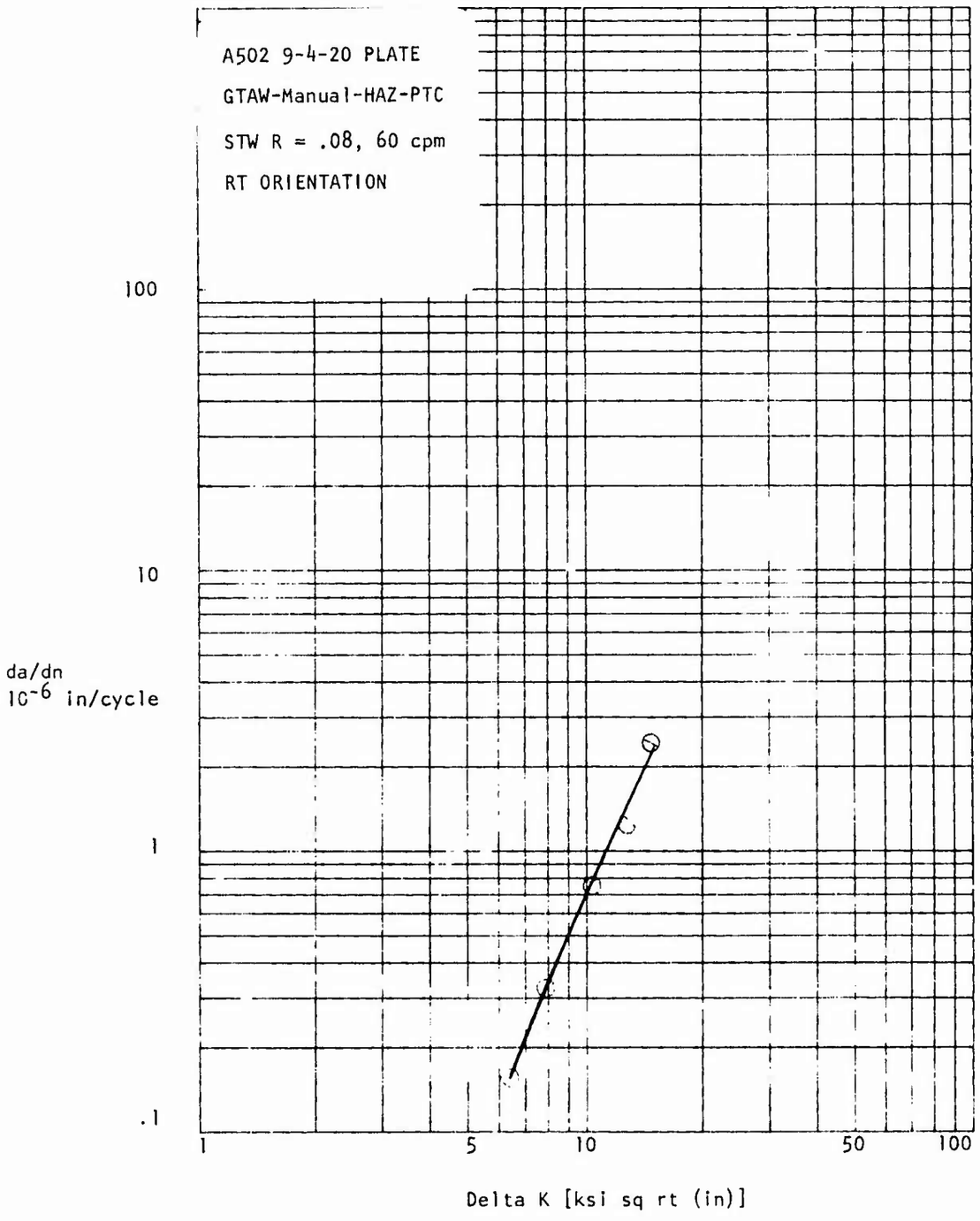


Figure 57 NRT A502 Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in STW

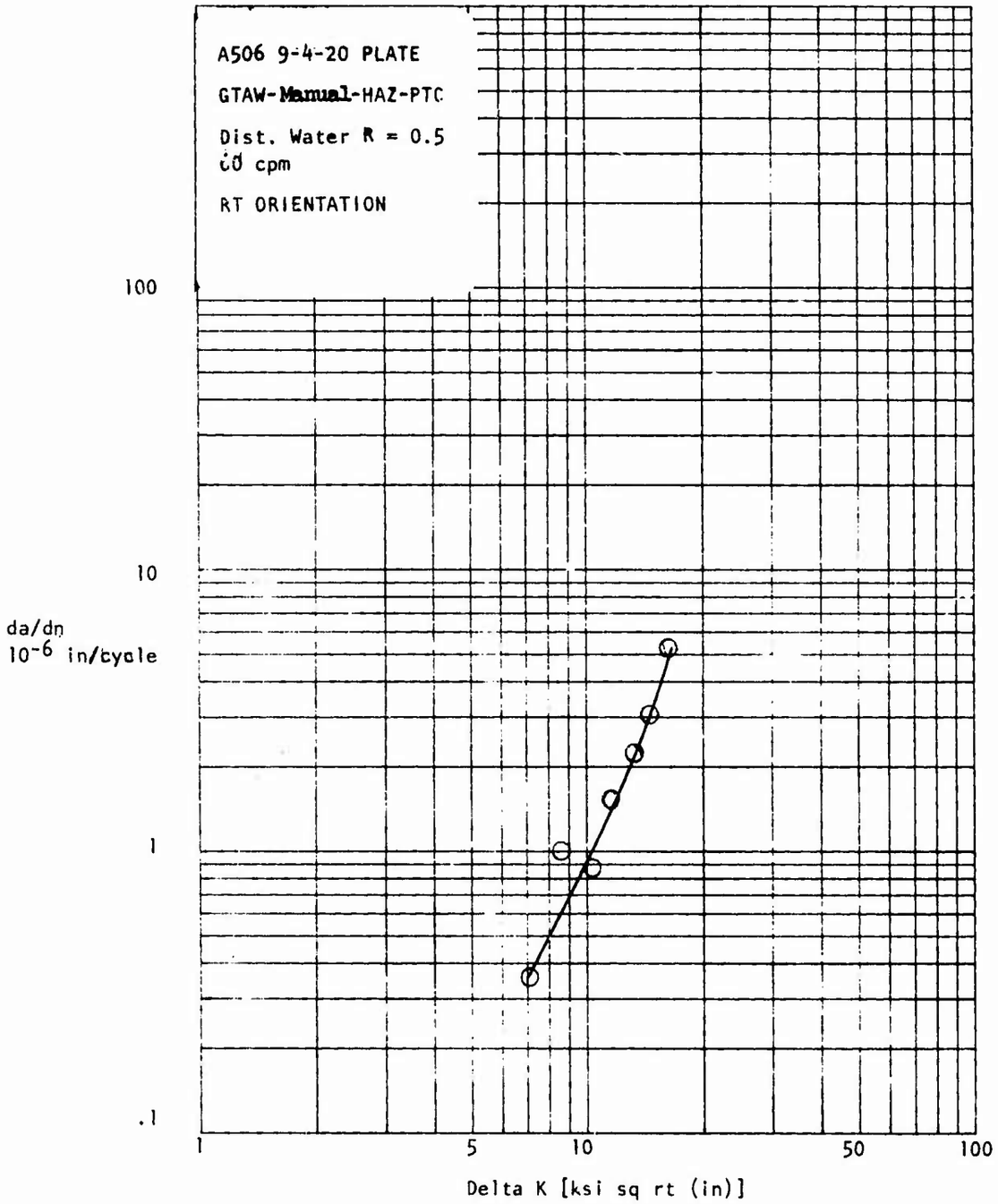


Figure 57 NRT A506 Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in Distilled Water

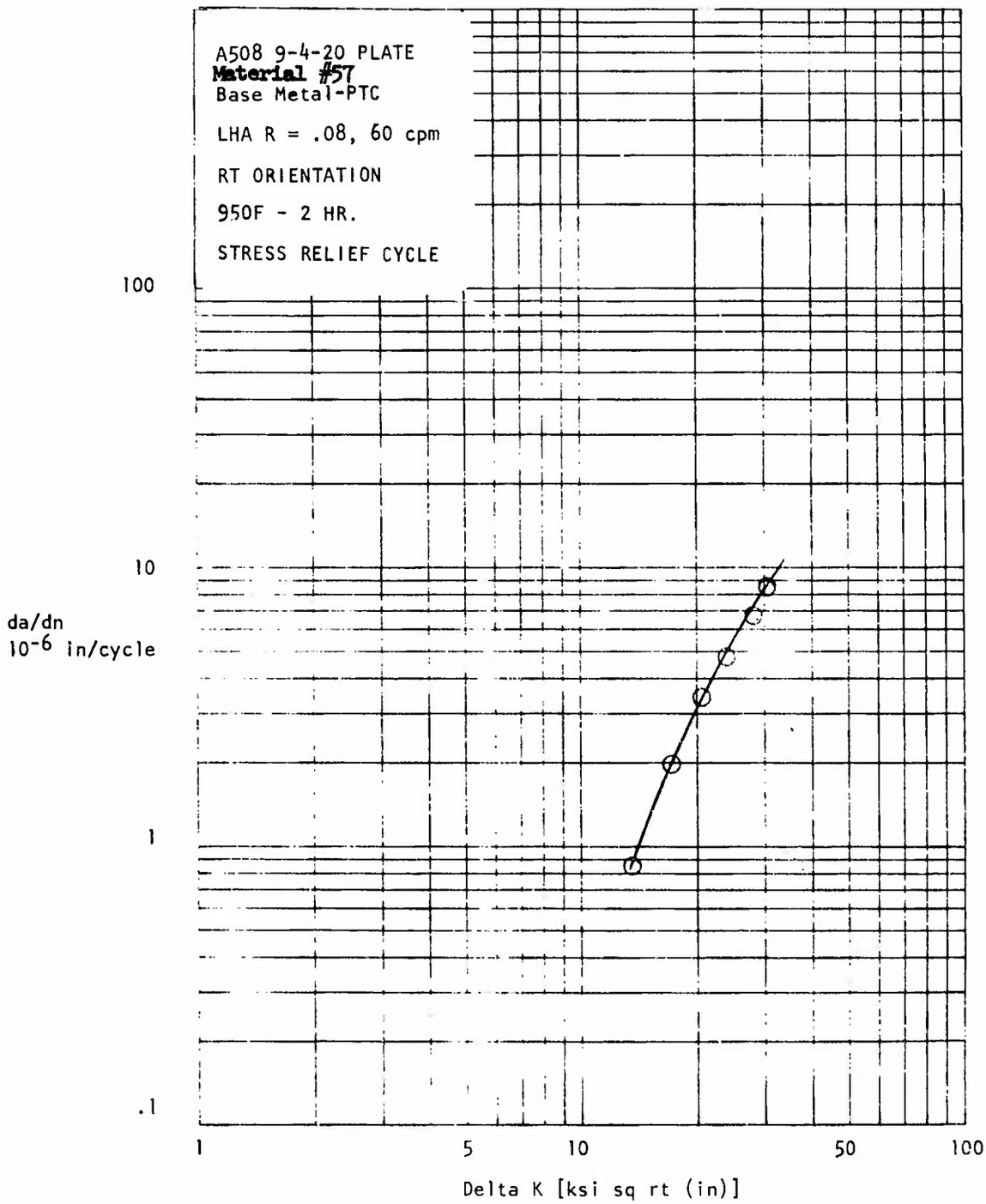


Figure 57 NRT A508 Fatigue Crack Growth Rate in the Base Metal of a 9-4-20 PTC Specimen in LHA

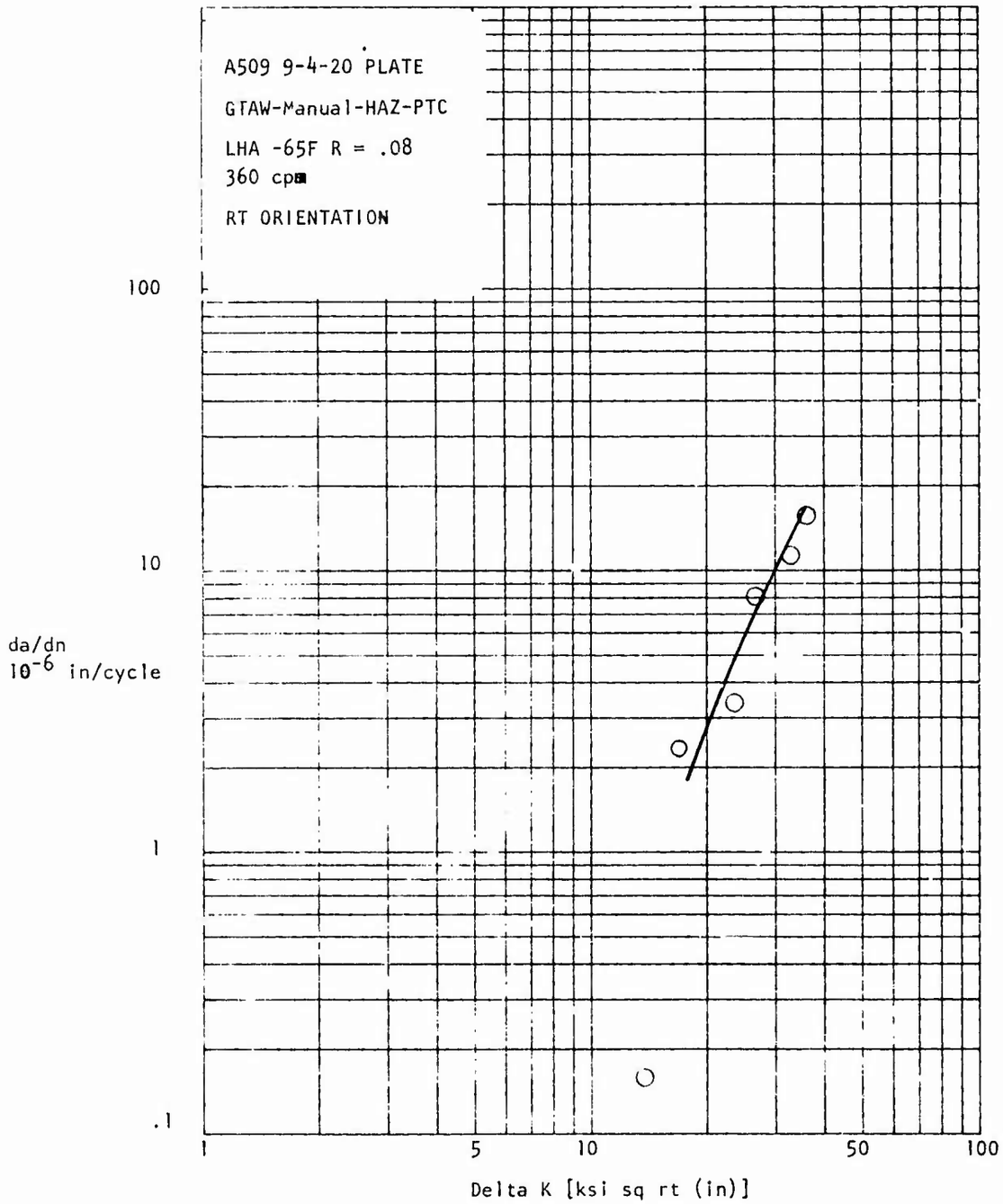


Figure 57 NRT A509 Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in LHA at -65F

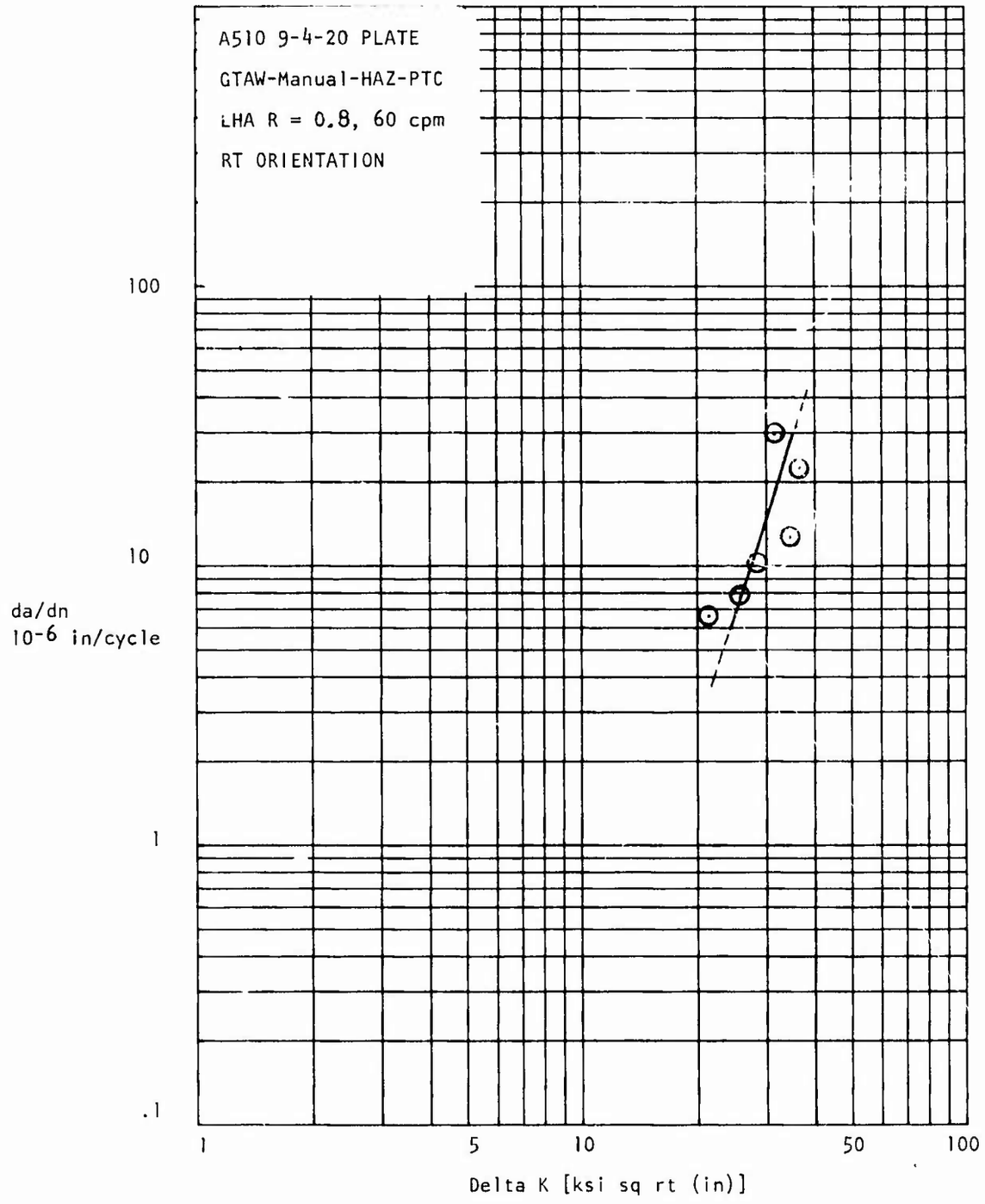


Figure 57 NRT A510 Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in LHA

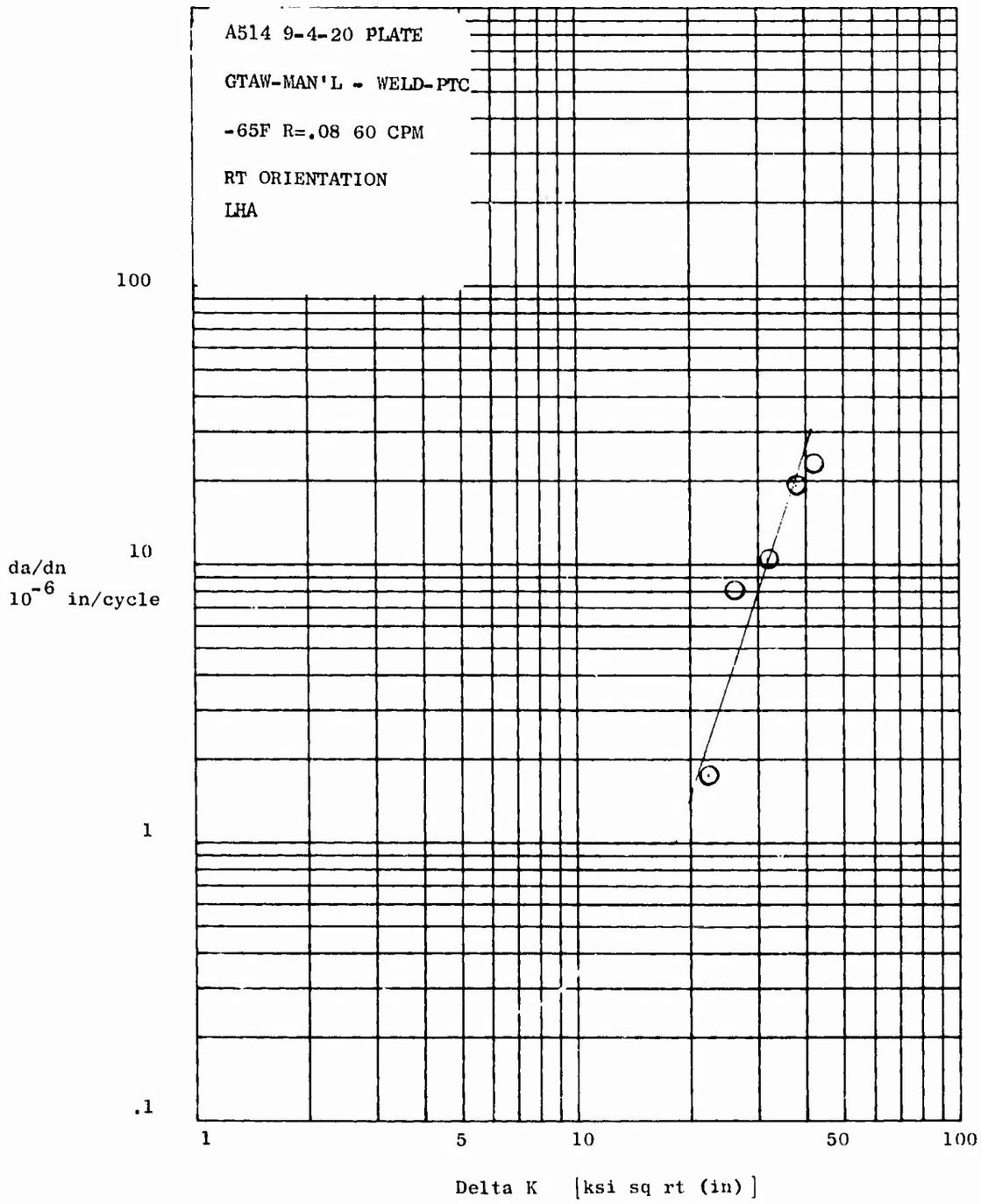


Figure 57 NRT A514 Fatigue Crack Growth Rate At -65F In The Weld Of A Welded 9-4-20 Plate PTC Specimen.

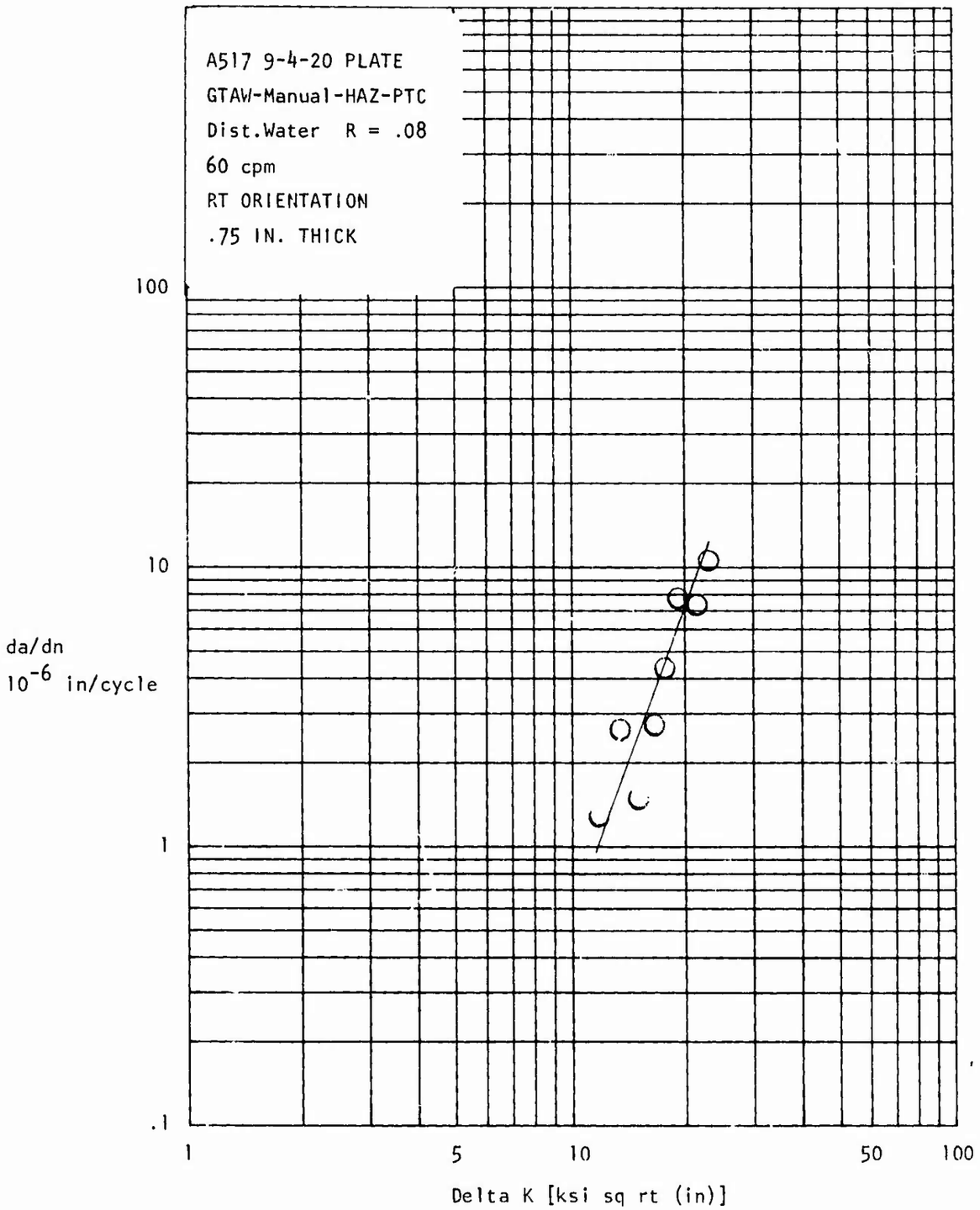


Figure 57 NRT A517 . Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in Distilled Water

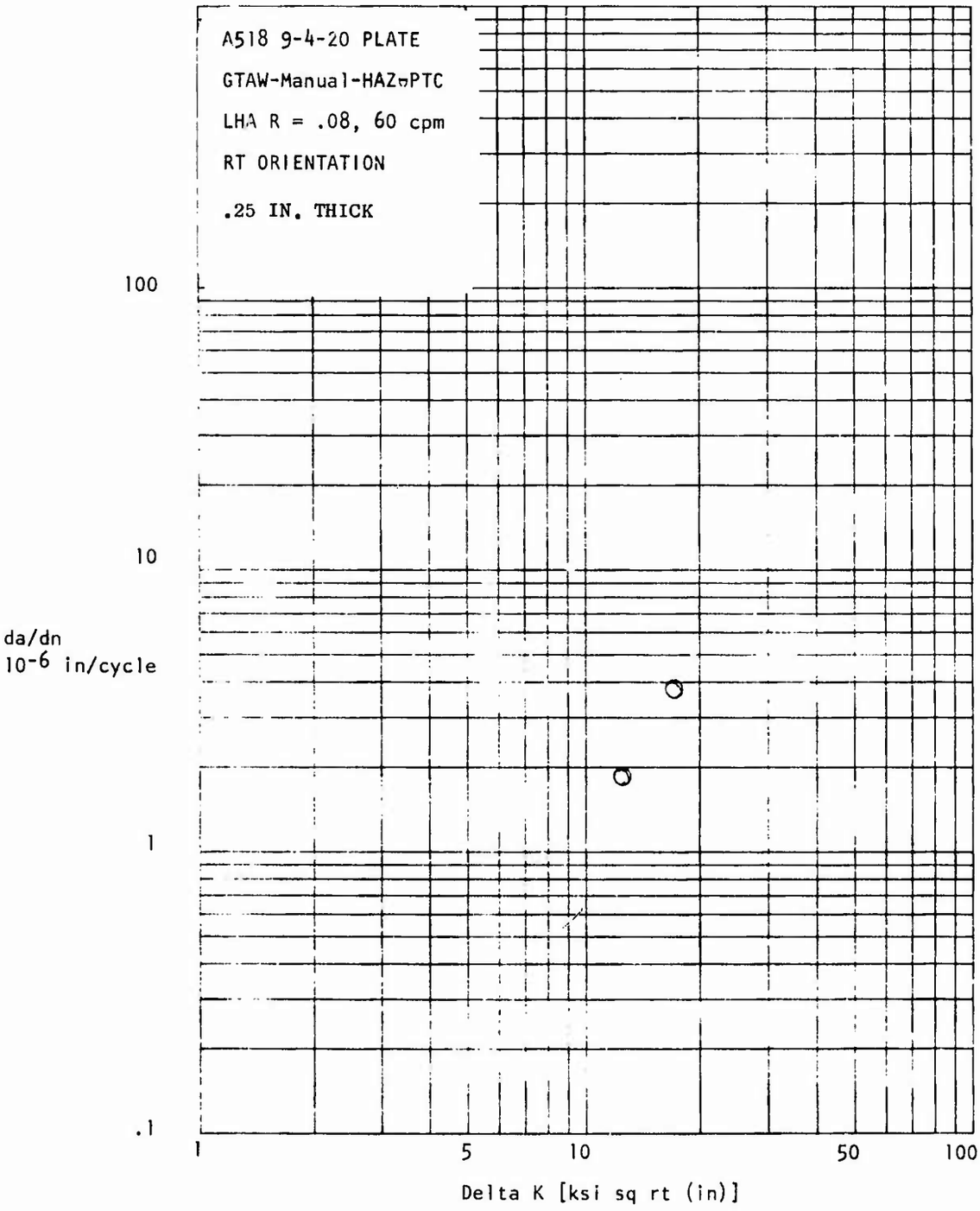


Figure 57 NRT A518 Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in LHA

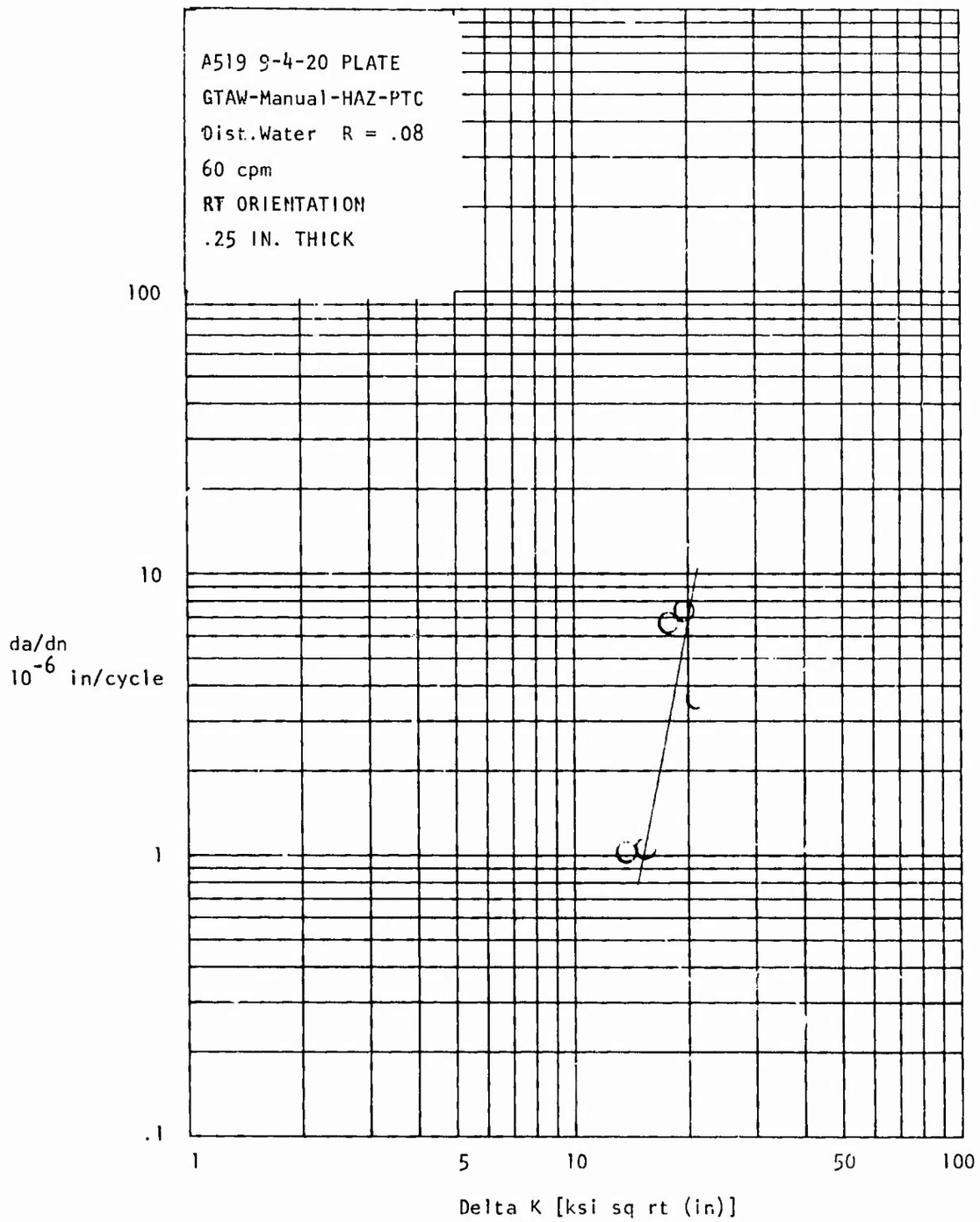


Figure 57 NRT A519 . Fatigue Crack Growth Rate in the HAZ of a Welded 9-4-20 Plate PTC Specimen in Distilled Water

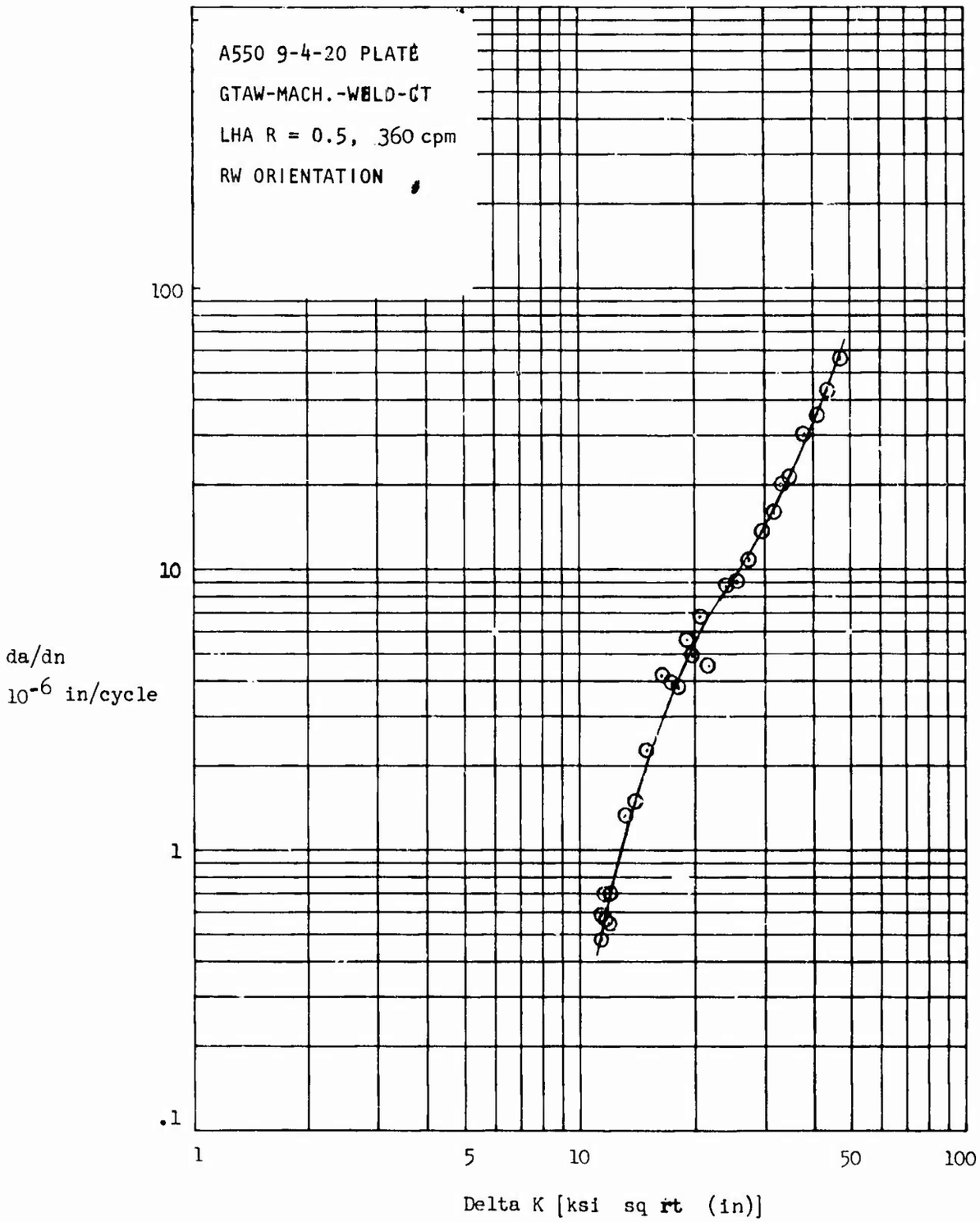


Figure 57 NRW A550 Fatigue Crack Growth Rate in the Weld Metal of A Welded 9-4-20 Plate CT Specimen in LHA

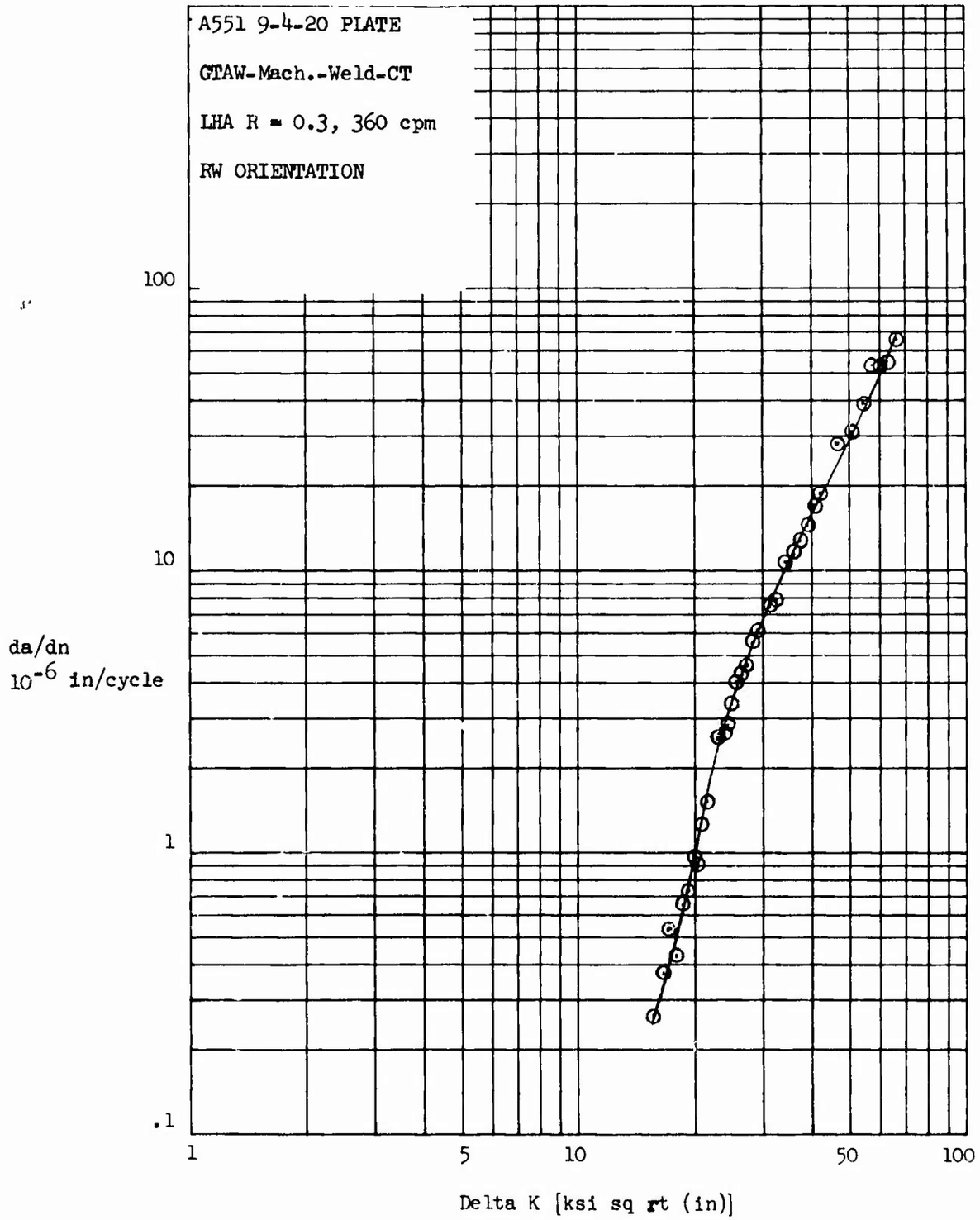


Figure 57 NRW A551 Fatigue Crack Growth Rate in the Weld Metal of a Welded 9-4-20 Plate CT Specimen in LHA

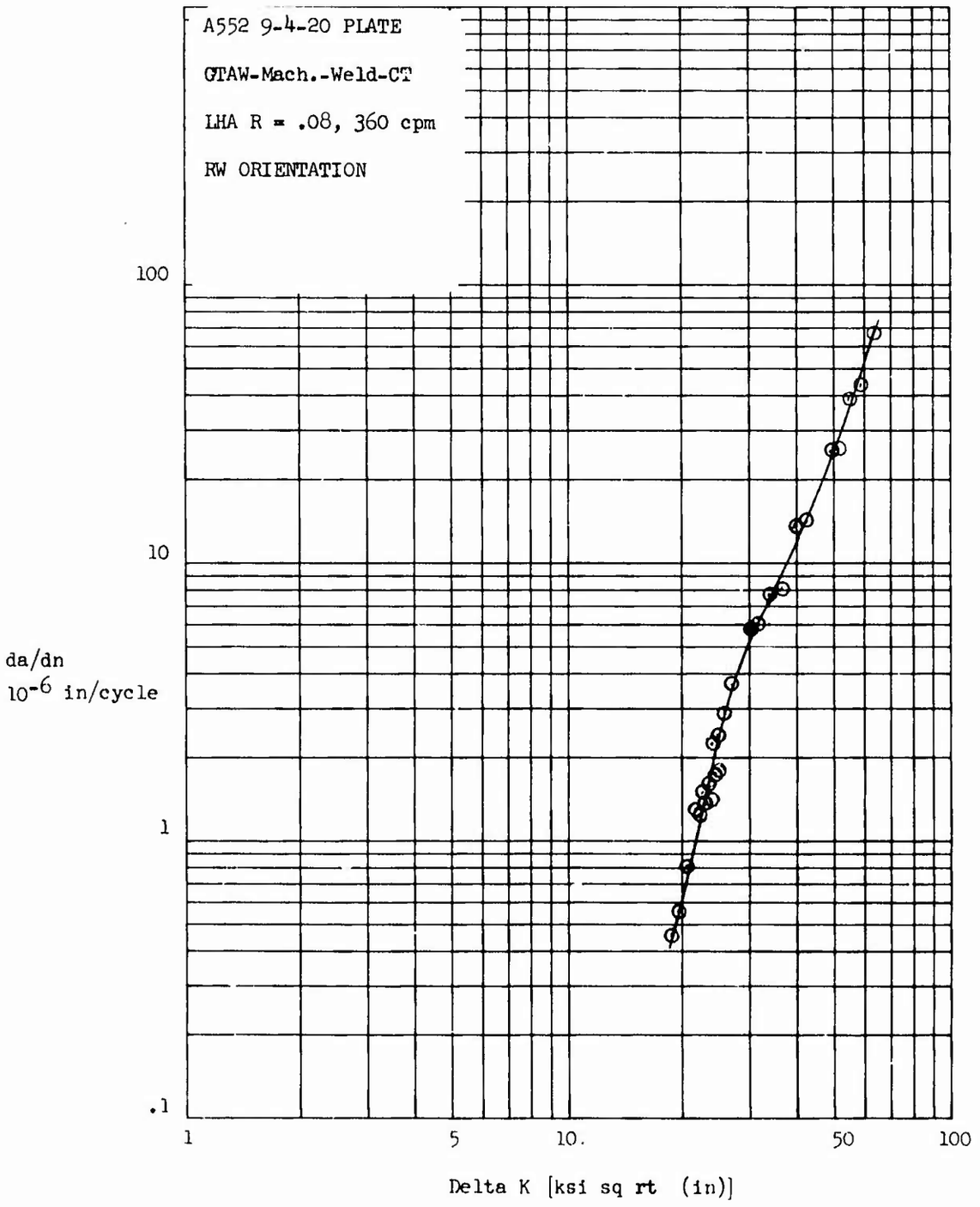


Figure 57 NRW A552 Fatigue Crack Growth Rate in the Weld Metal of a Welded 9-4-20 Plate CT Specimen in LHA

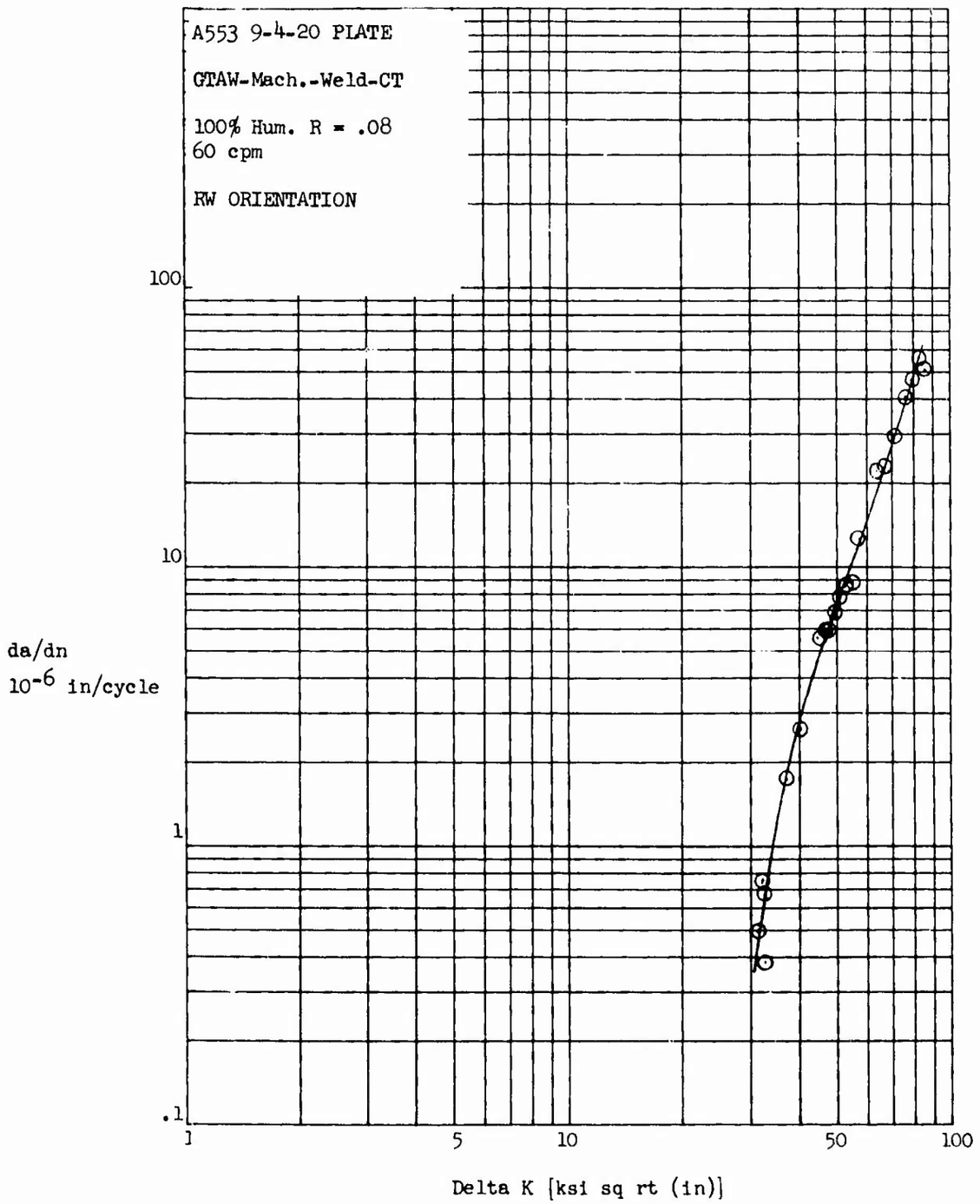


Figure 57 NRW A553 Fatigue Crack Growth Rate in the Weld Metal of a Welded 9-4-20 Plate CT Specimen in 100% Humidity

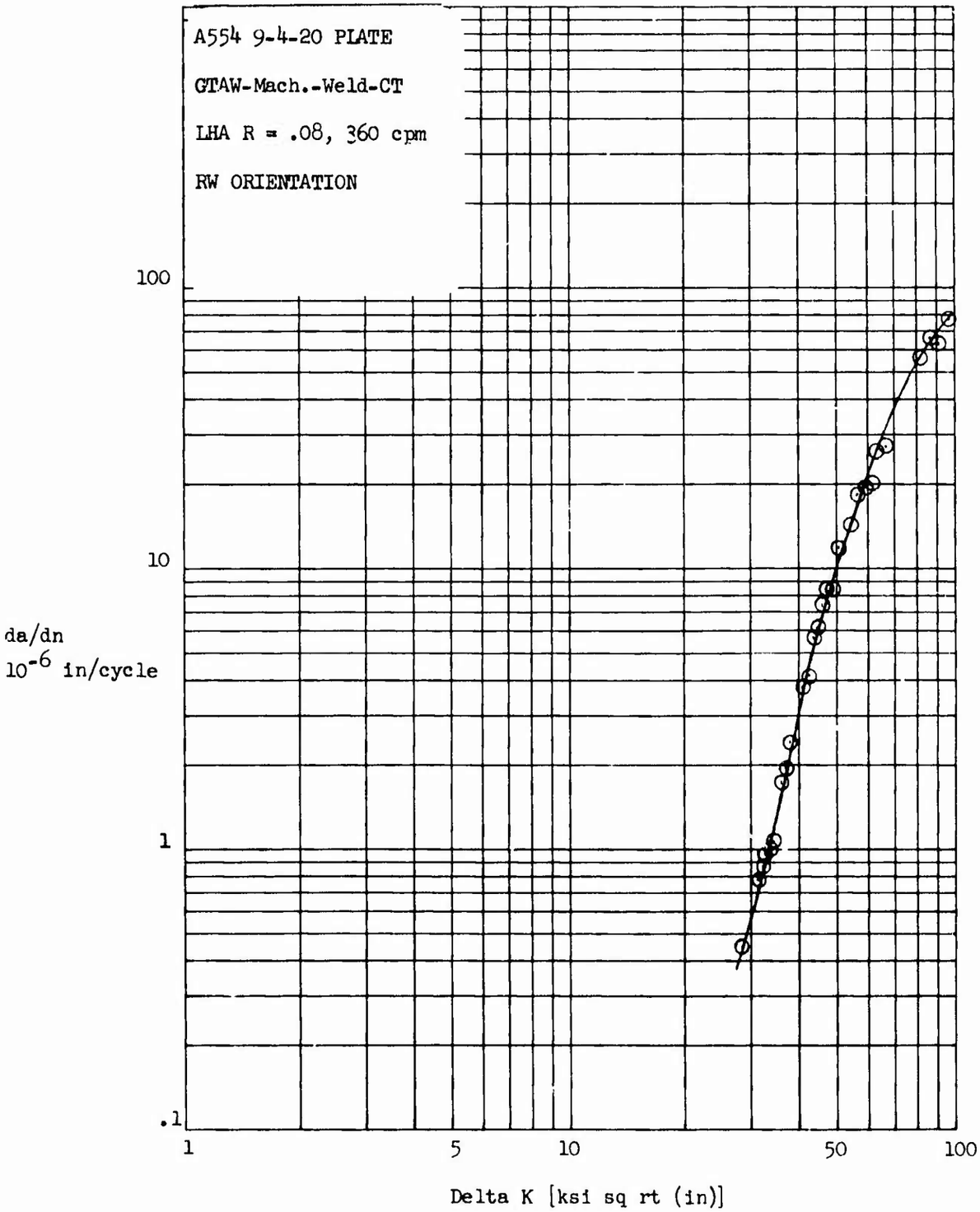


Figure 57 NRW A554 Fatigue Crack Growth Rate in the Weld Metal of a Welded 9-4-20 Plate CT Specimen in LHA

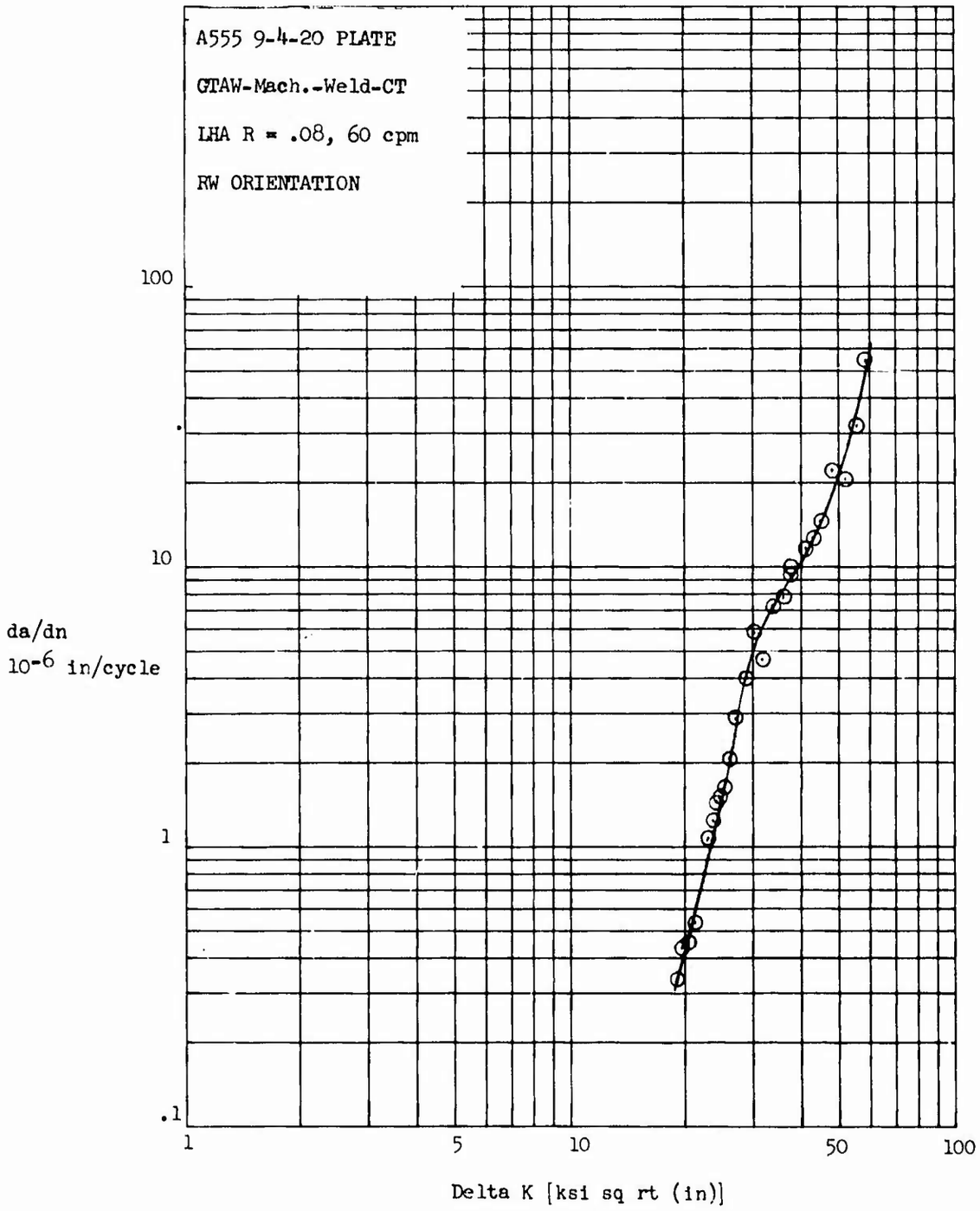


Figure 57 NRW A555 Fatigue Crack Growth Rate in the Weld Metal of a Welded 9-4-20 Plate CT Specimen in LHA

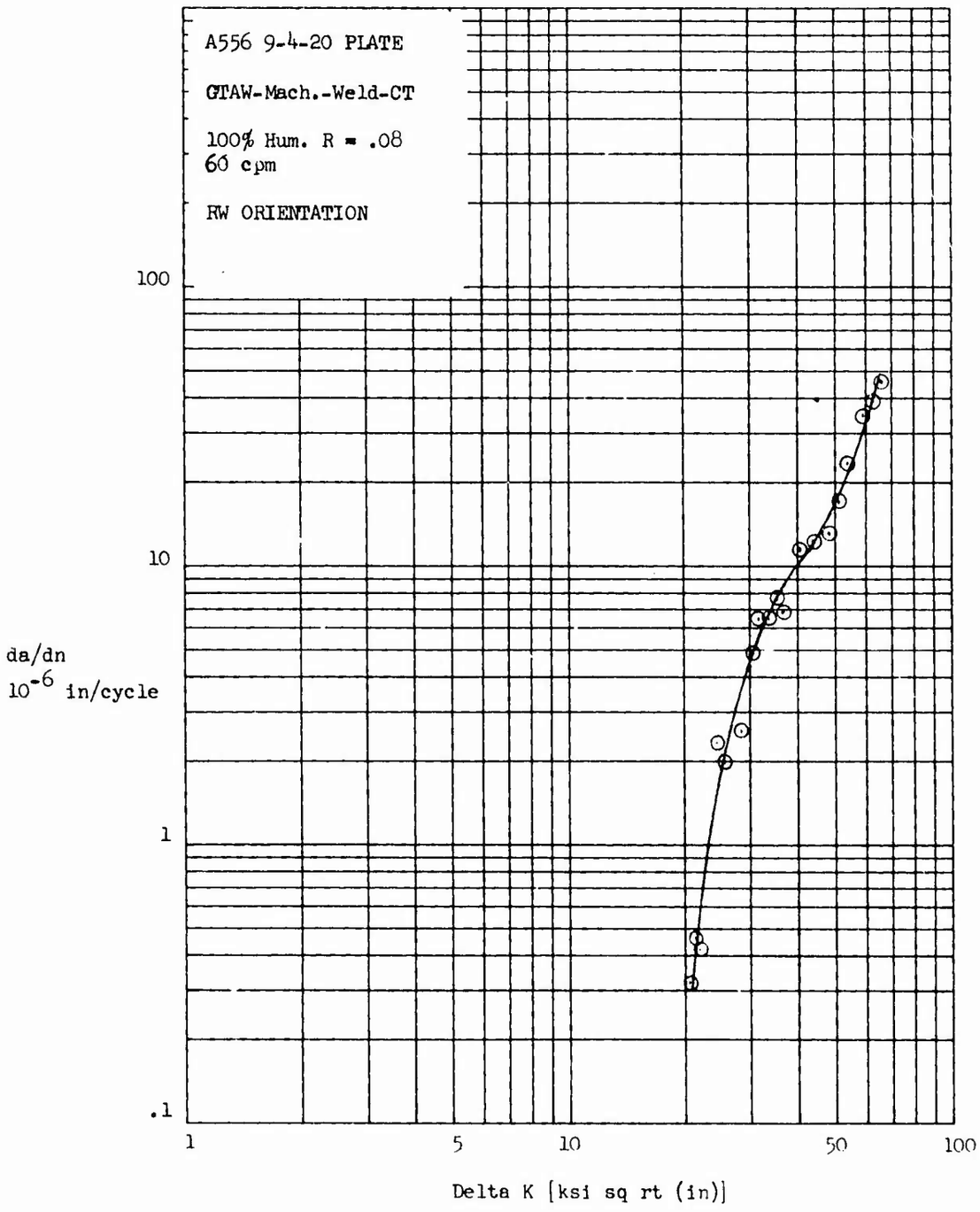


Figure 57 NRW A556 Fatigue Crack Growth Rate in the Weld Metal of a Welded 9-4-20 Plate CT Specimen in 100% Humidity

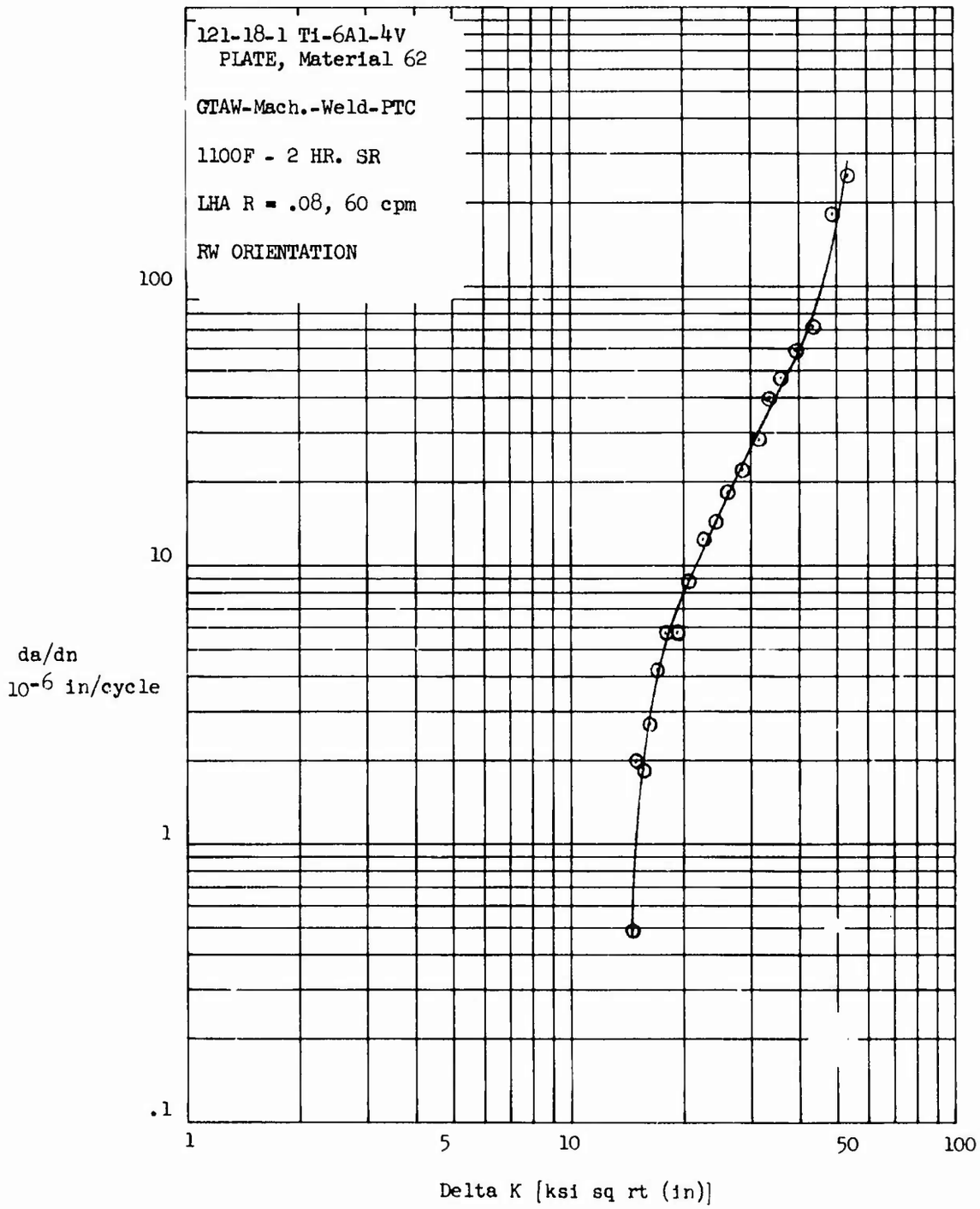


Figure 62 NRW 121-18-1 Fatigue Crack Growth Rate in the Weld Metal of a Welded Ti-6Al-4V Plate PTC Specimen in LHA

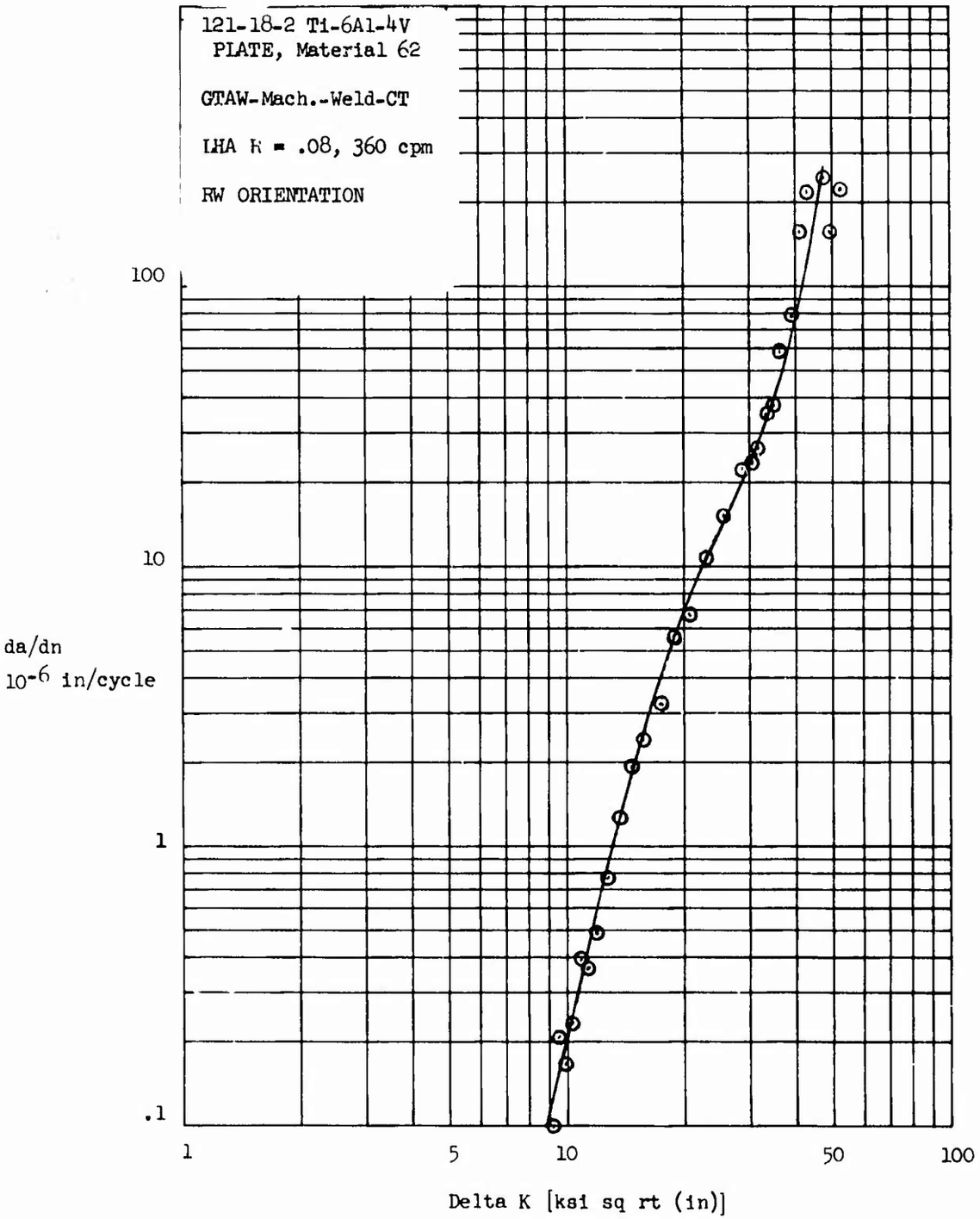


Figure 62 NRW 121-18-2 Fatigue Crack Growth Rate in the Weld Metal of a Welded Ti-6Al-4V Plate CT Specimen in LHA

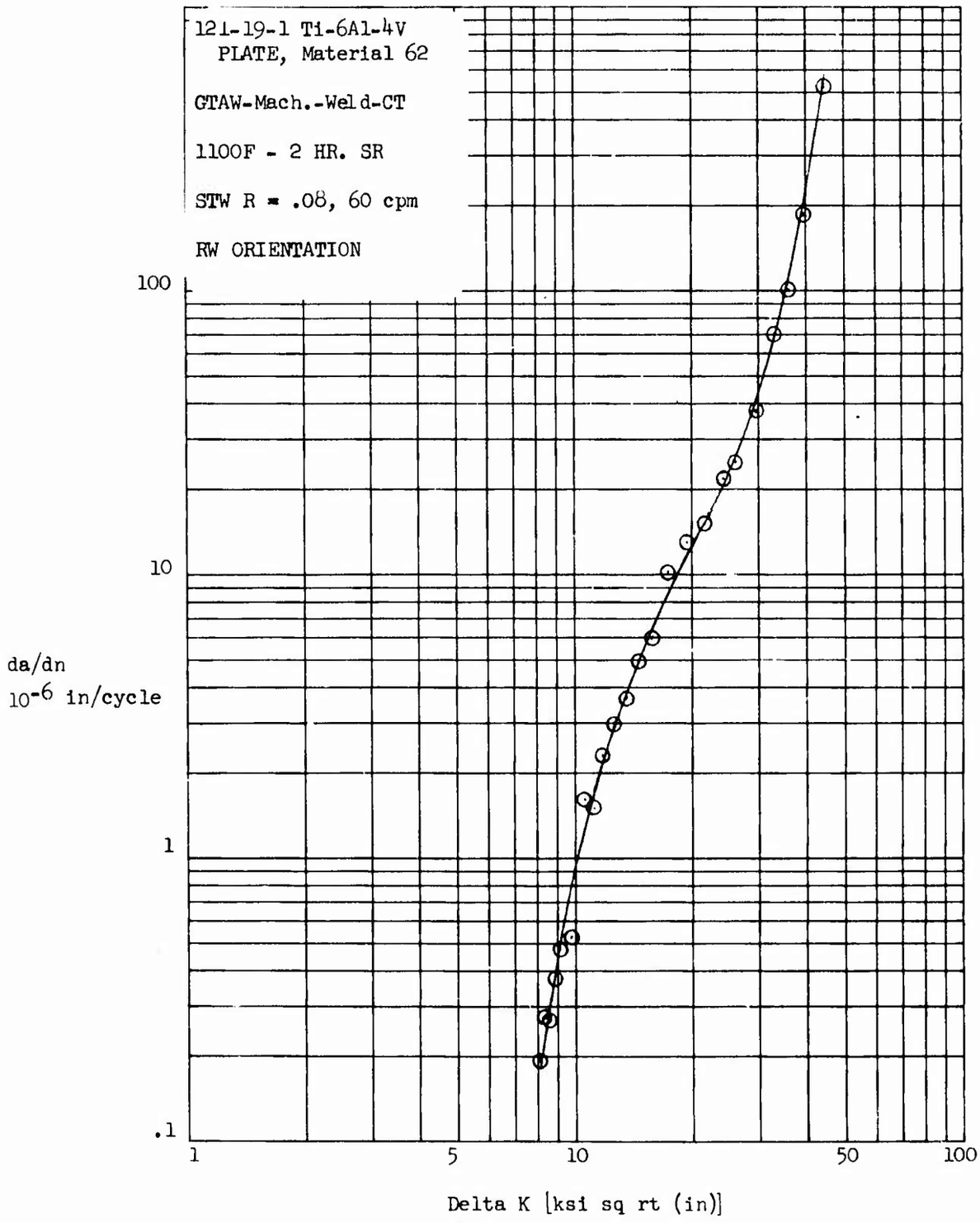


Figure 62 NRW 121-19-1 Fatigue Crack Growth Rate in the Weld Metal of a Welded Ti-6Al-4V Plate CT Specimen in STW

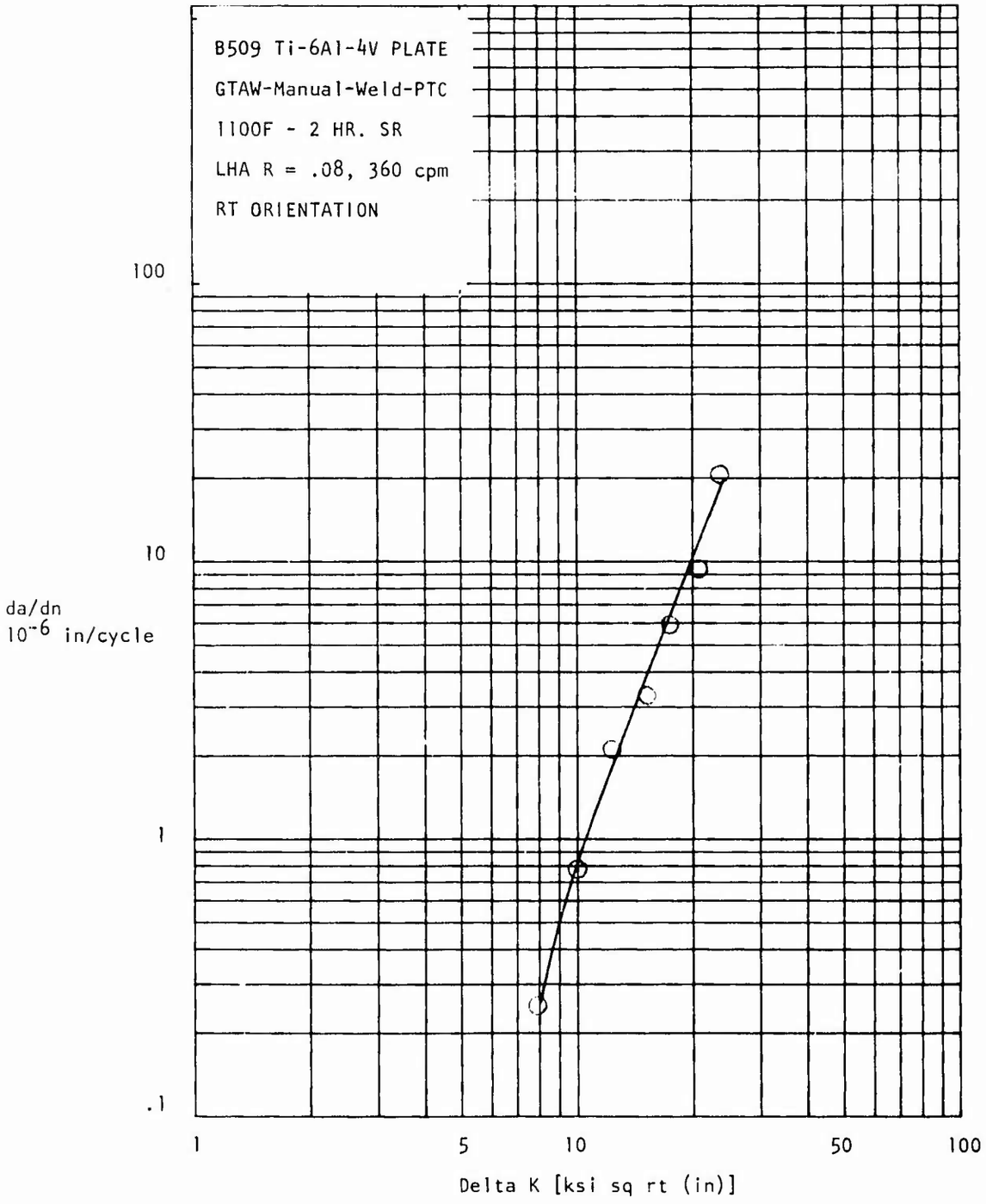


Figure 70 NRT B509 Fatigue Crack Growth Rate in the Weld of a Welded Ti-6Al-4V Plate PTC Specimen in LHA

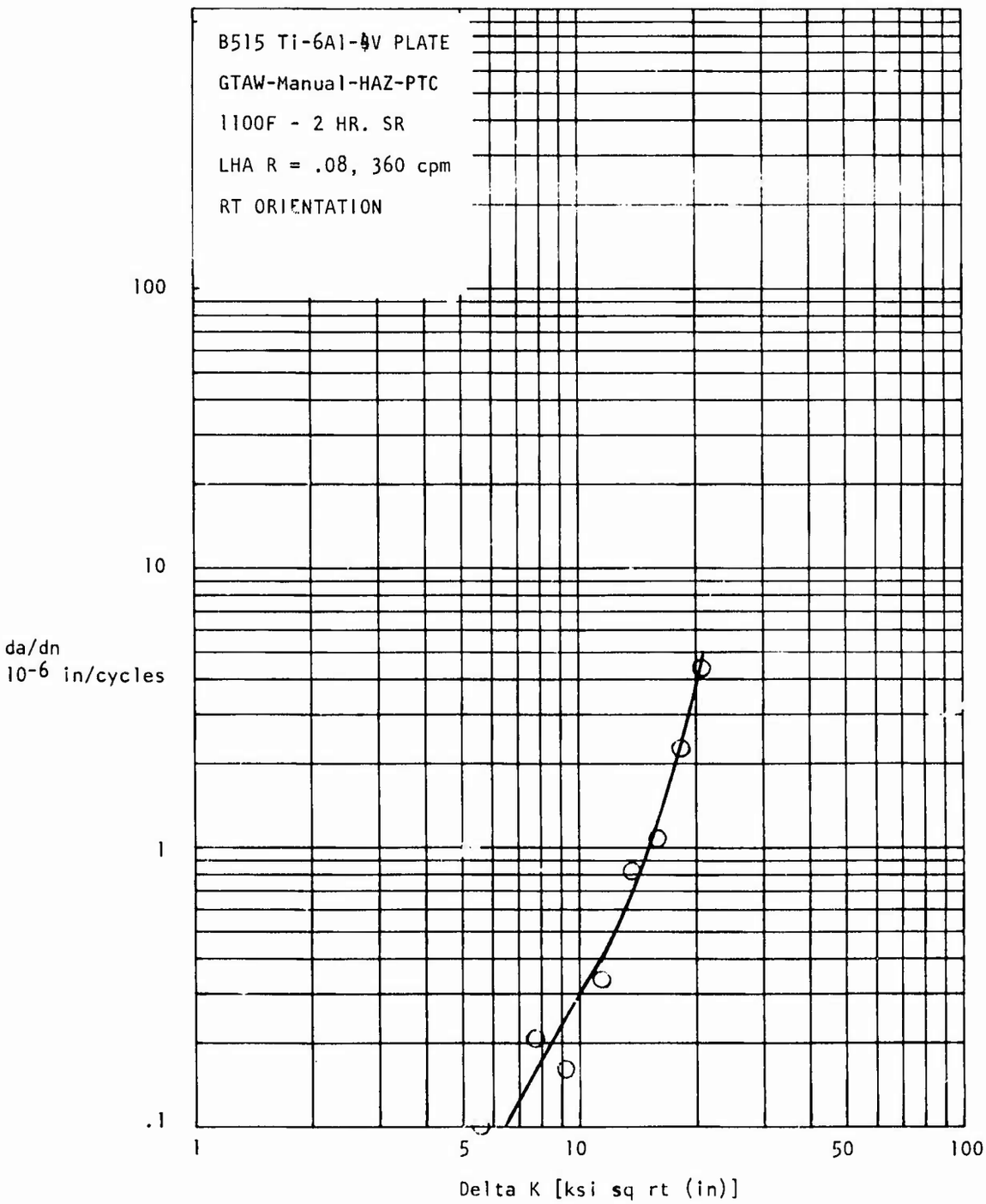


Figure 75 NRT B515 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA

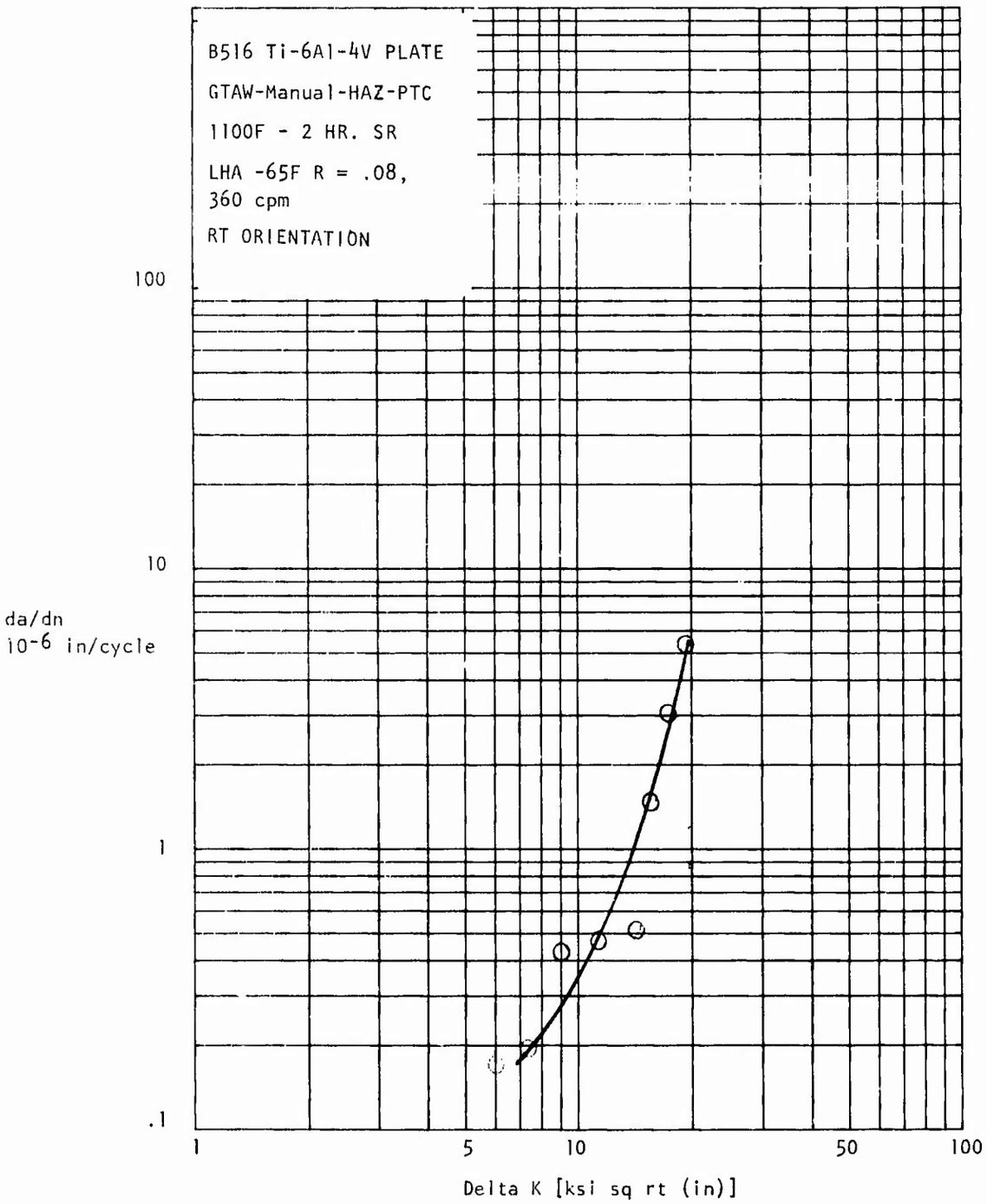


Figure 75 NRT B516 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA at -65F

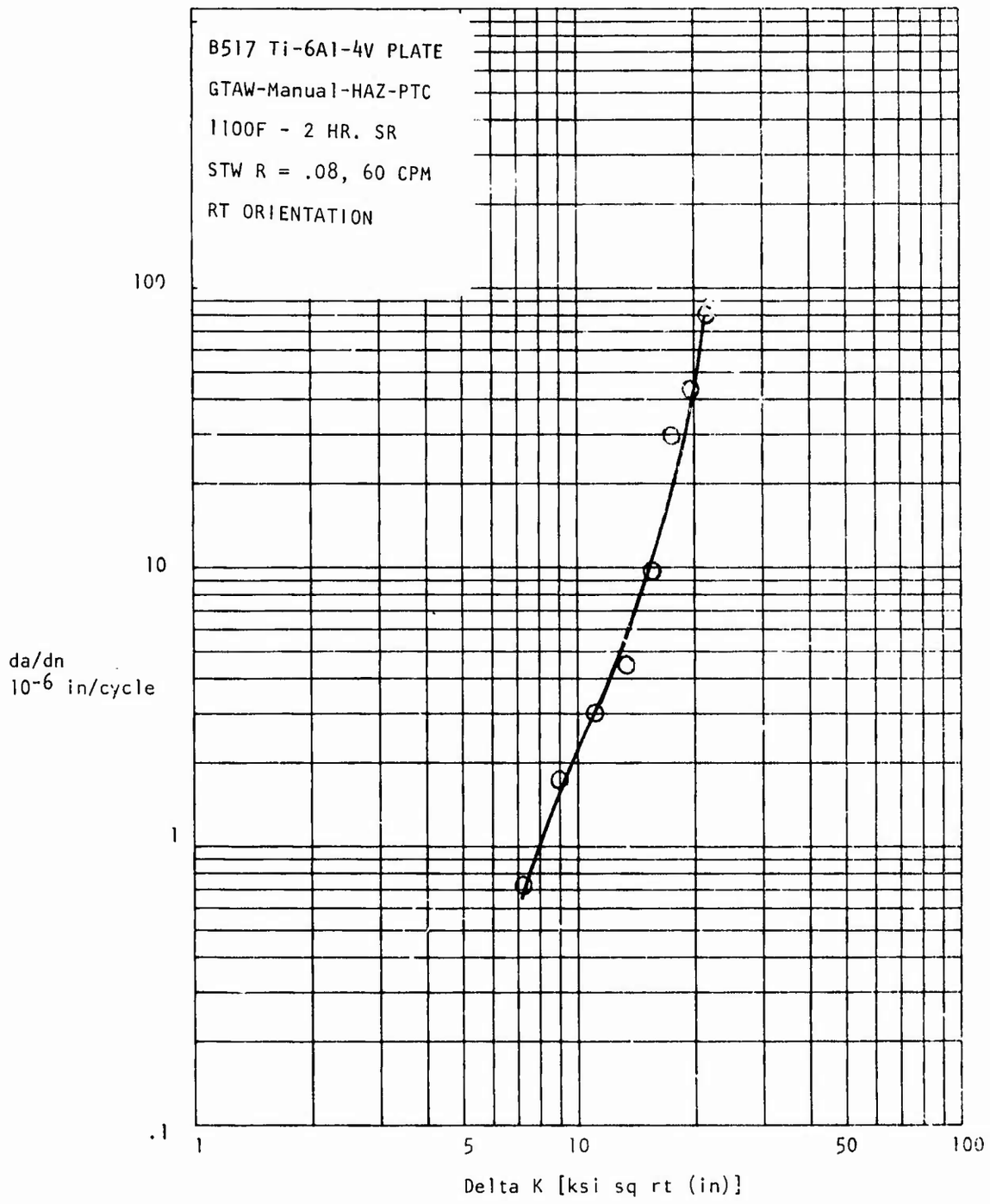


Figure 75 NRT B517 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in STW

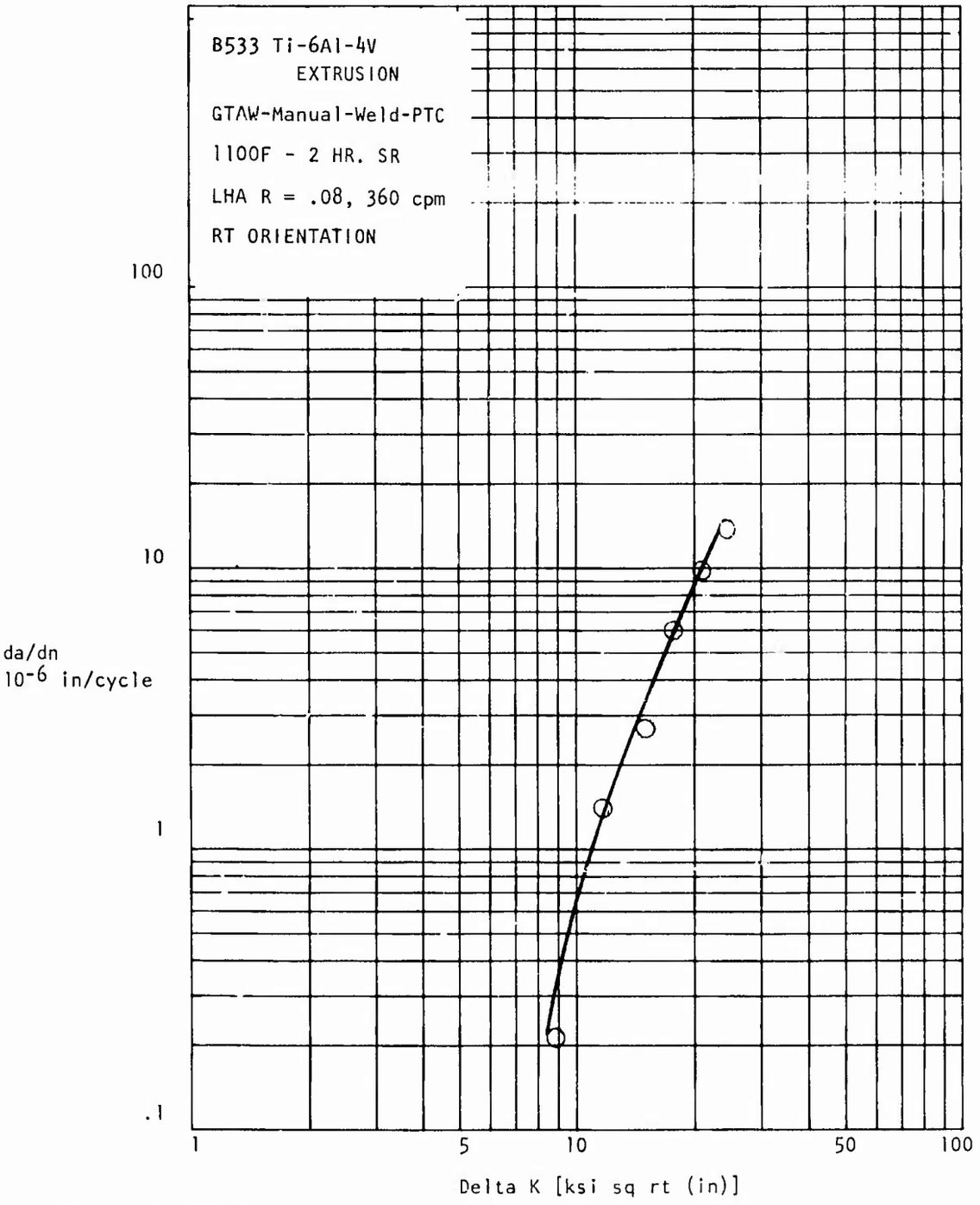


Figure 75 NRT B533 Fatigue Crack Growth Rate in the Weld Metal of a Welded Ti-6Al-4V Extrusion PTC Specimen

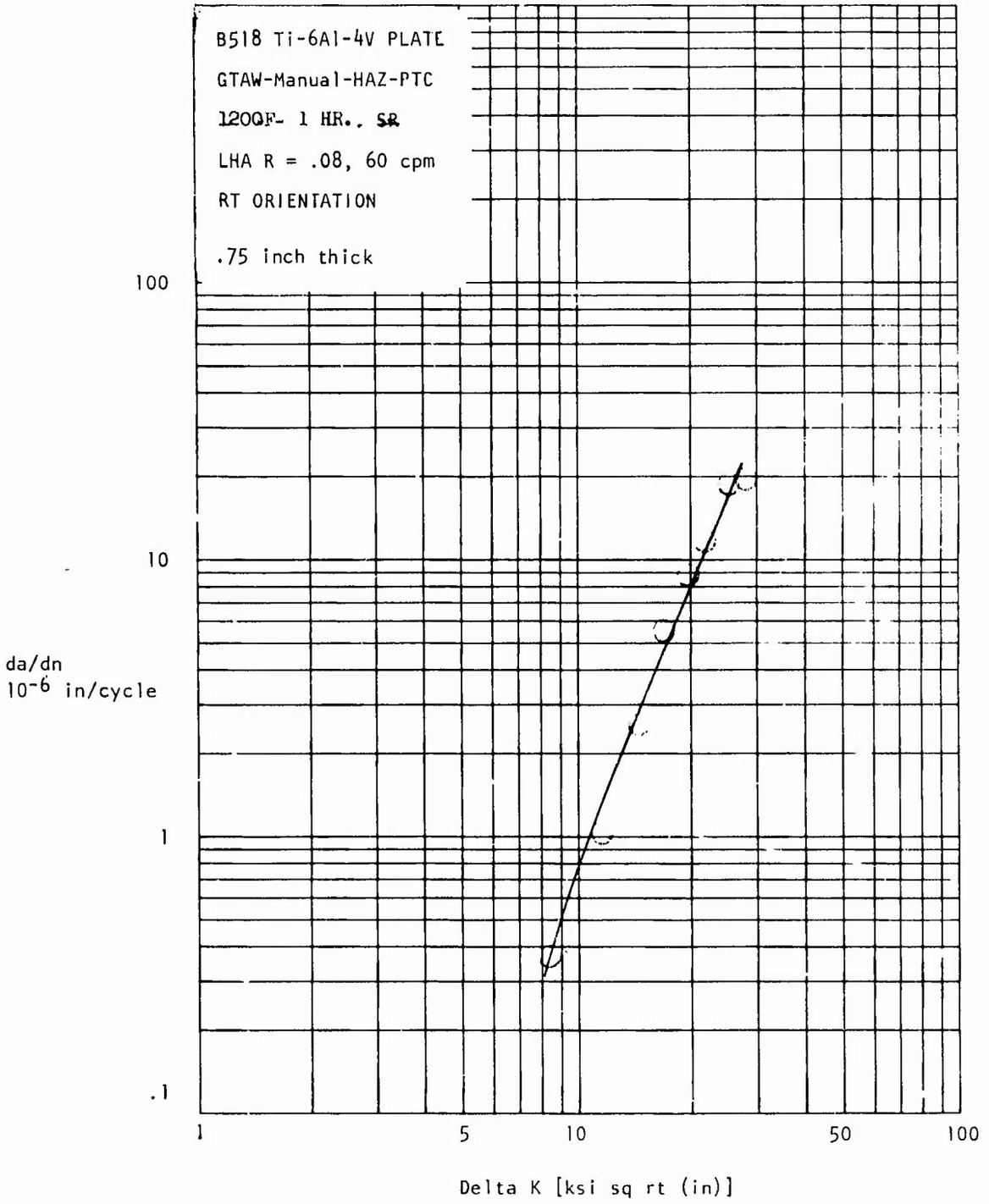


Figure 76 NRT B518 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA

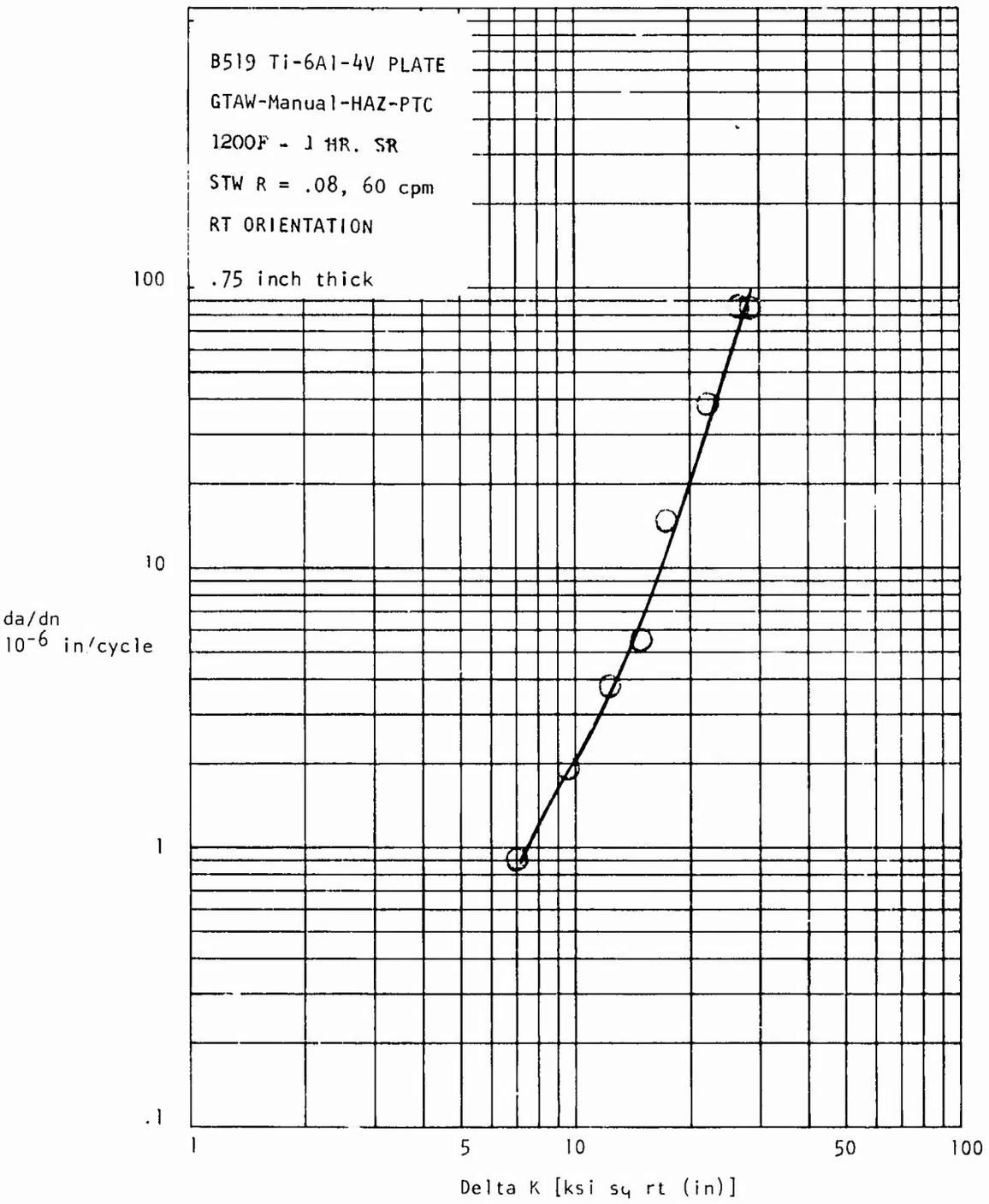


Figure 76 NRT B519 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in STW

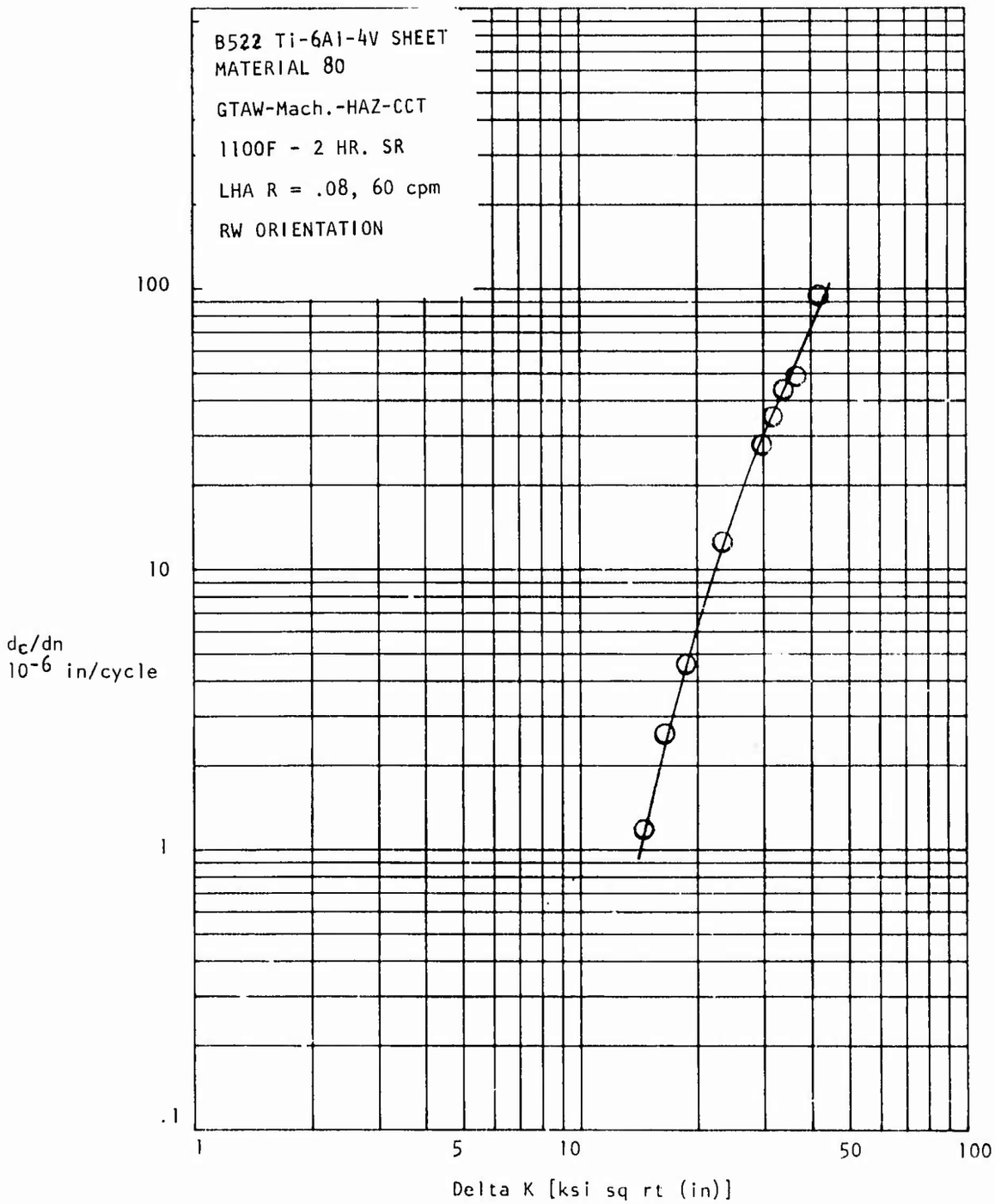


Figure 89 NRW B522 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Sheet CCT Specimen in LHA

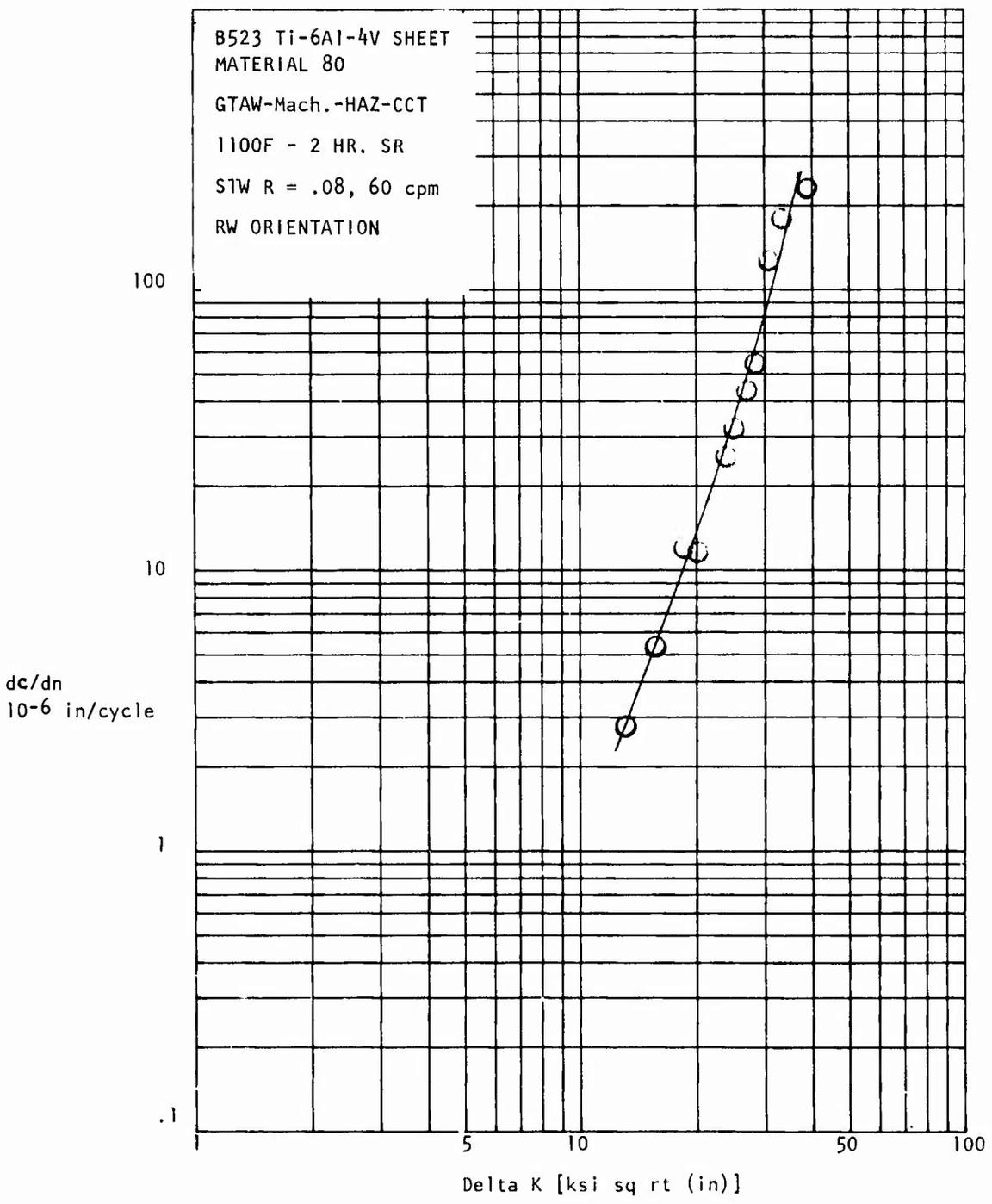


Figure 80 NRW: B523 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Sheet CCT Specimen in STW

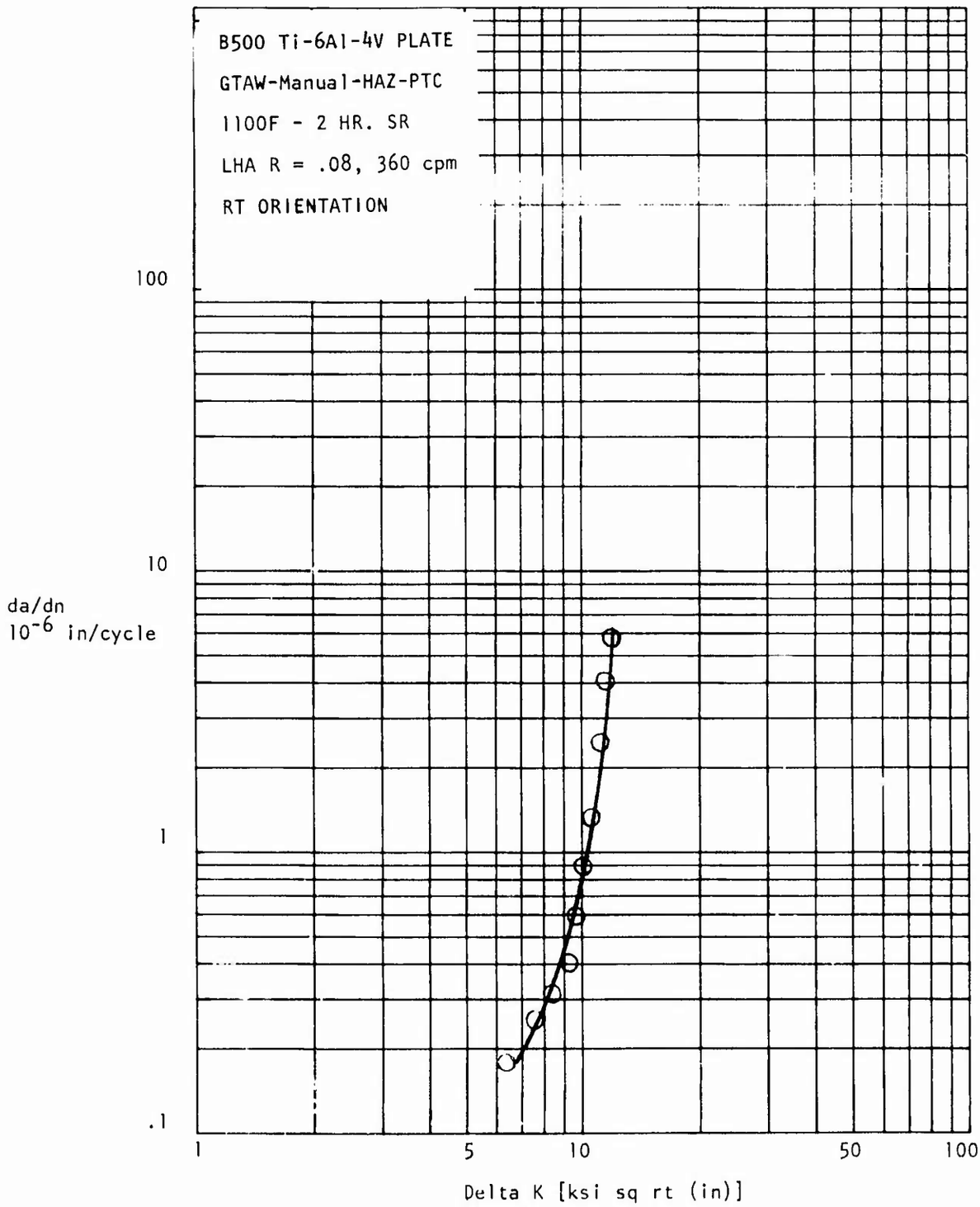


Figure 87 NRT B500 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA.

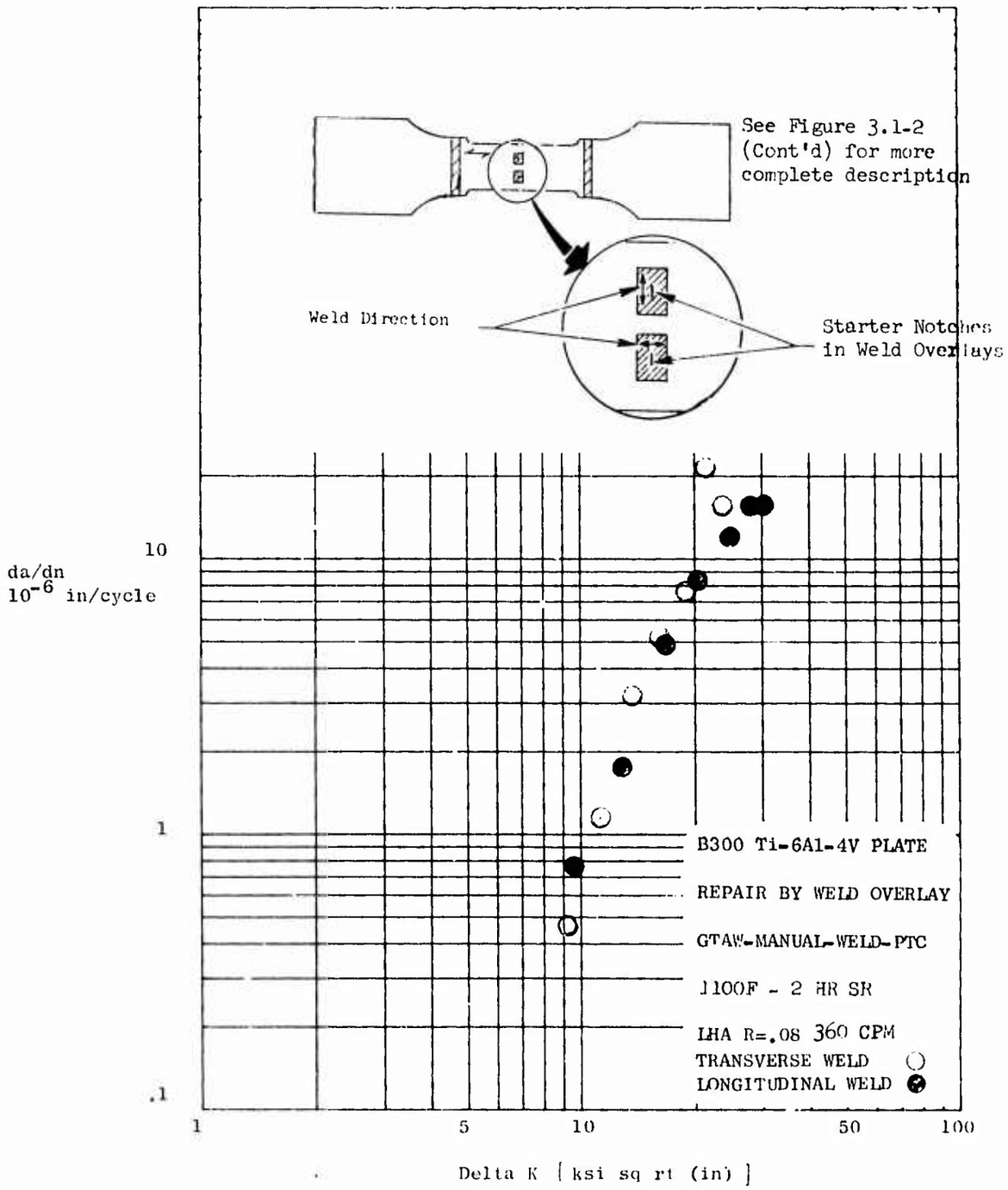


Figure 88 NRT B300 Fatigue Crack Growth Rate in a Special Overlay Repair Weld Specimen with Two Flaws (Stress Relieved Ti-6Al-4V Plate-PTC Specimen).

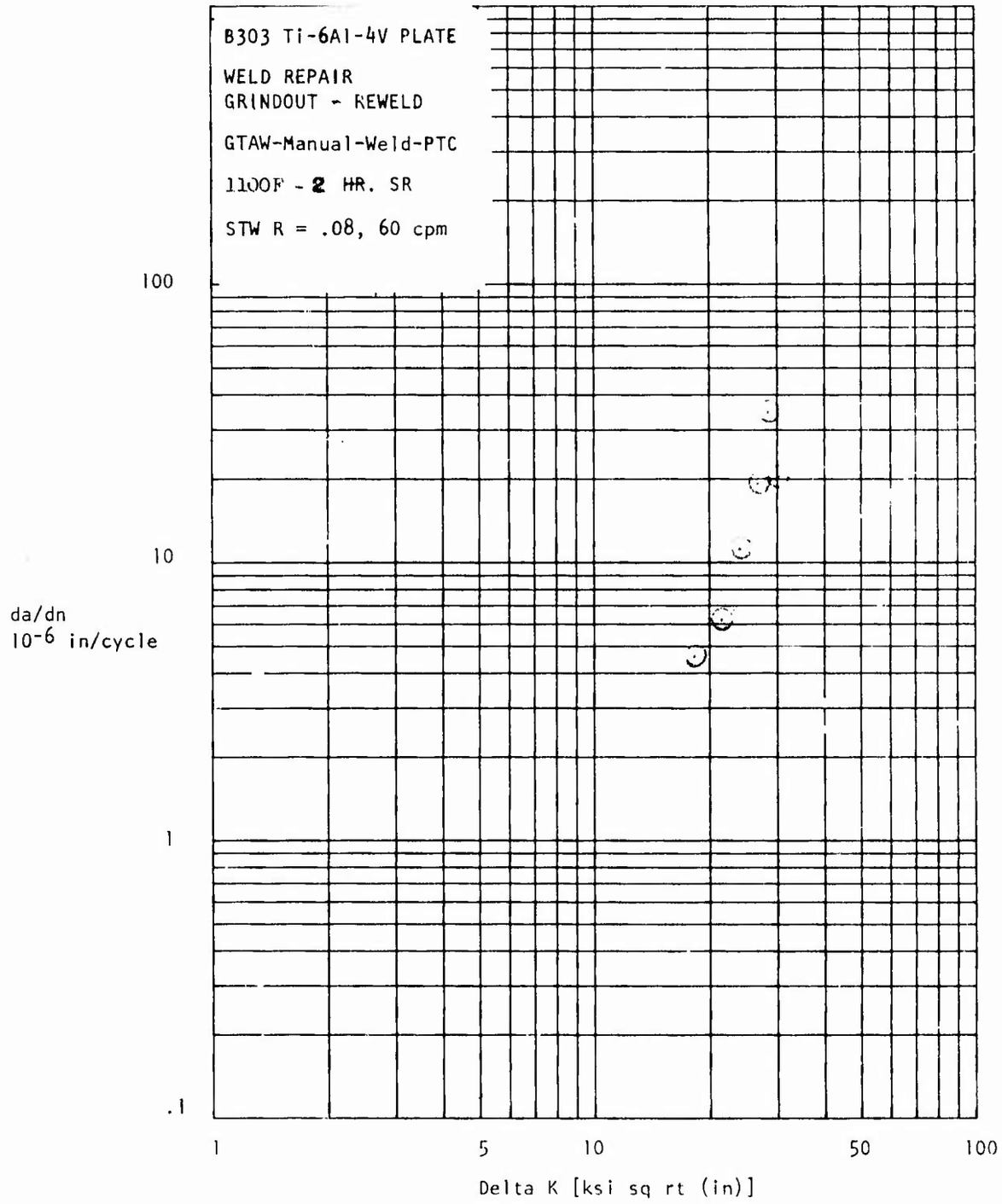


Figure 38 NRT B303 Fatigue Crack Growth Rate in the Weld of a Rewelded and Stress Relieved Ti-6Al-4V Plate PTC Specimen

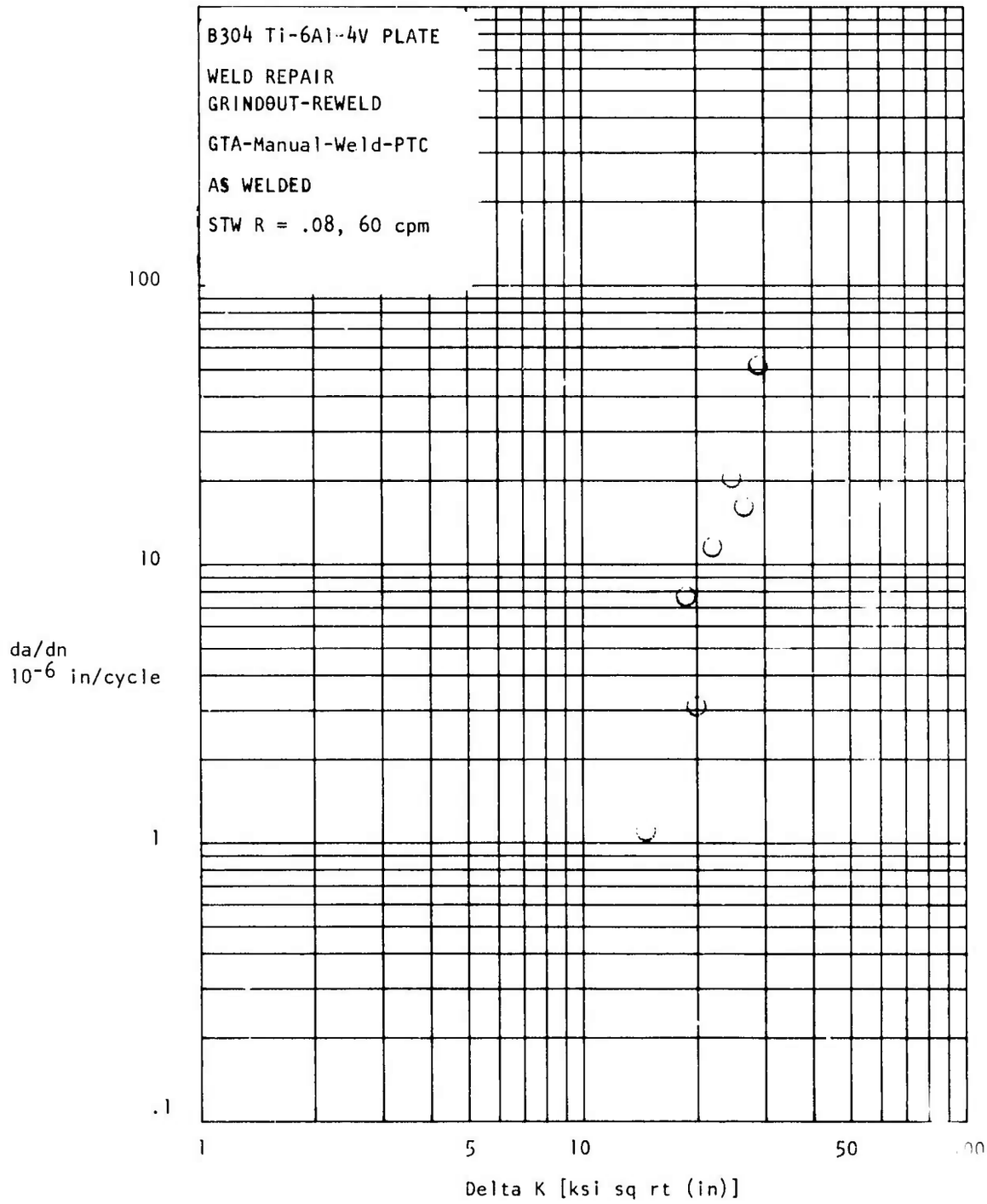


Figure 88 NRT B304 Fatigue Crack Growth Rate in the Weld of a Rewelded Ti-6Al-4V Plate PTC Specimen with no Stress Relief

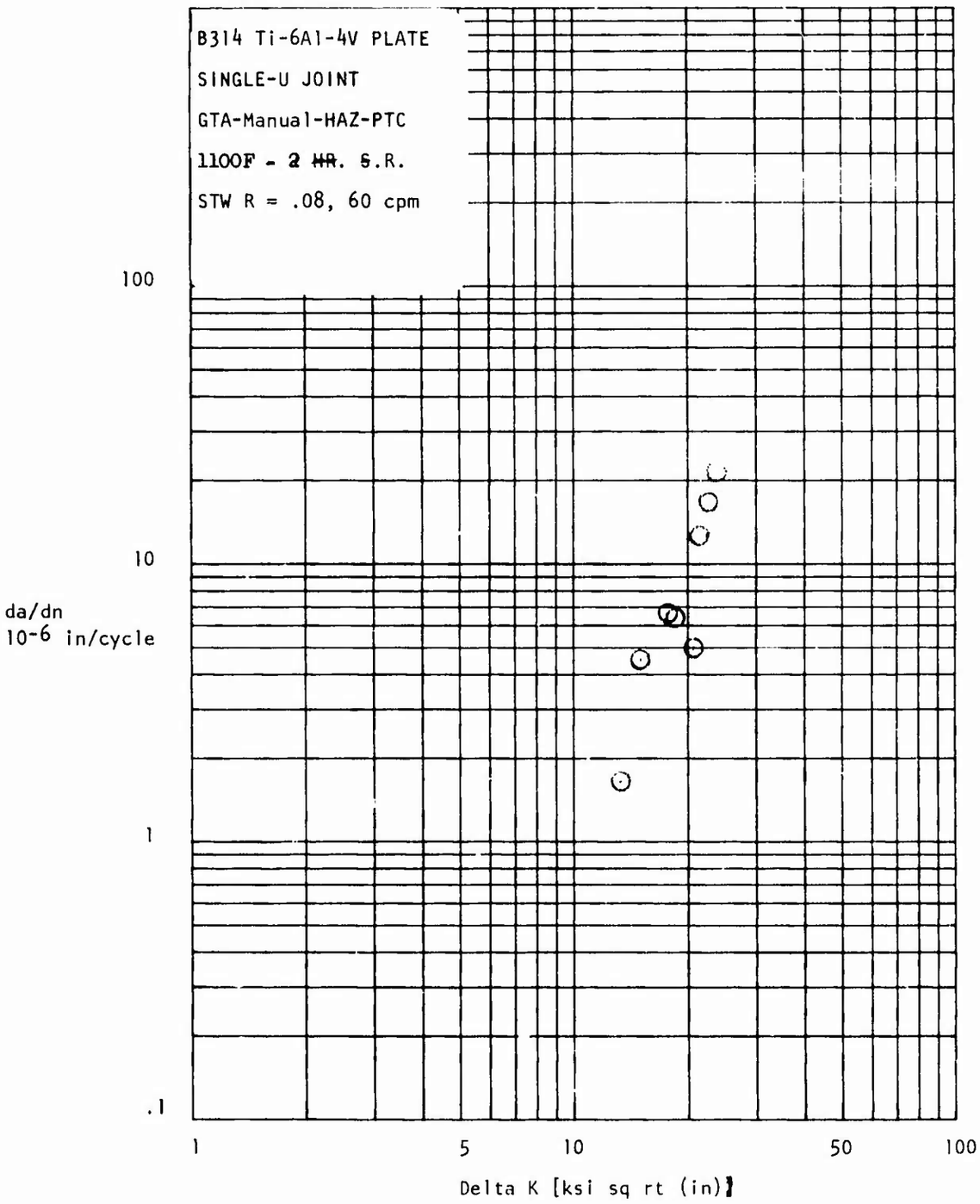


Figure 88 NRT B314 Fatigue Crack Growth Rate in the HAZ of a Welded and Stress Relieved Single-U Joint in a Ti-6Al-4V Plate PTC Specimen

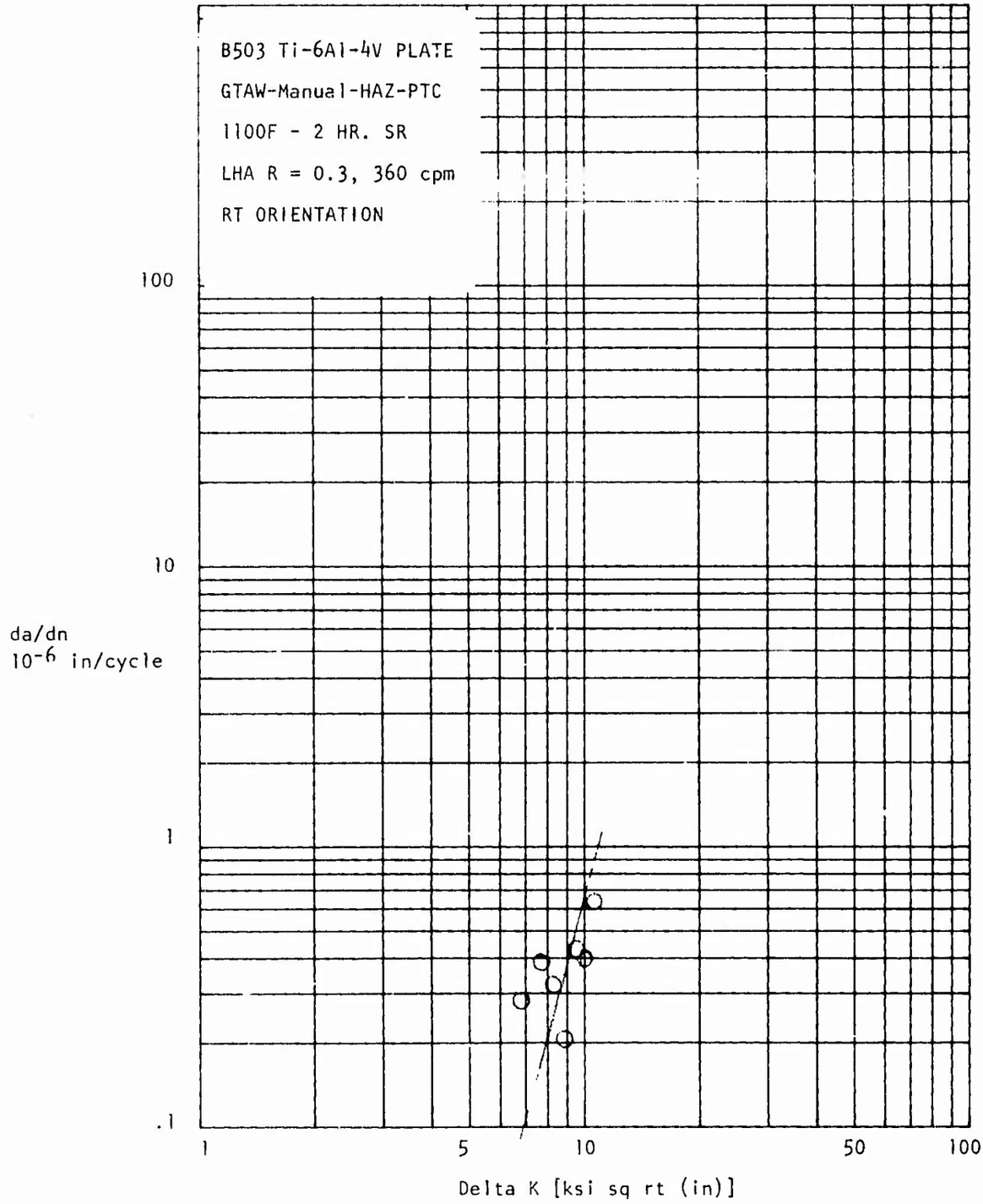


Figure 88 NRT B503 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA

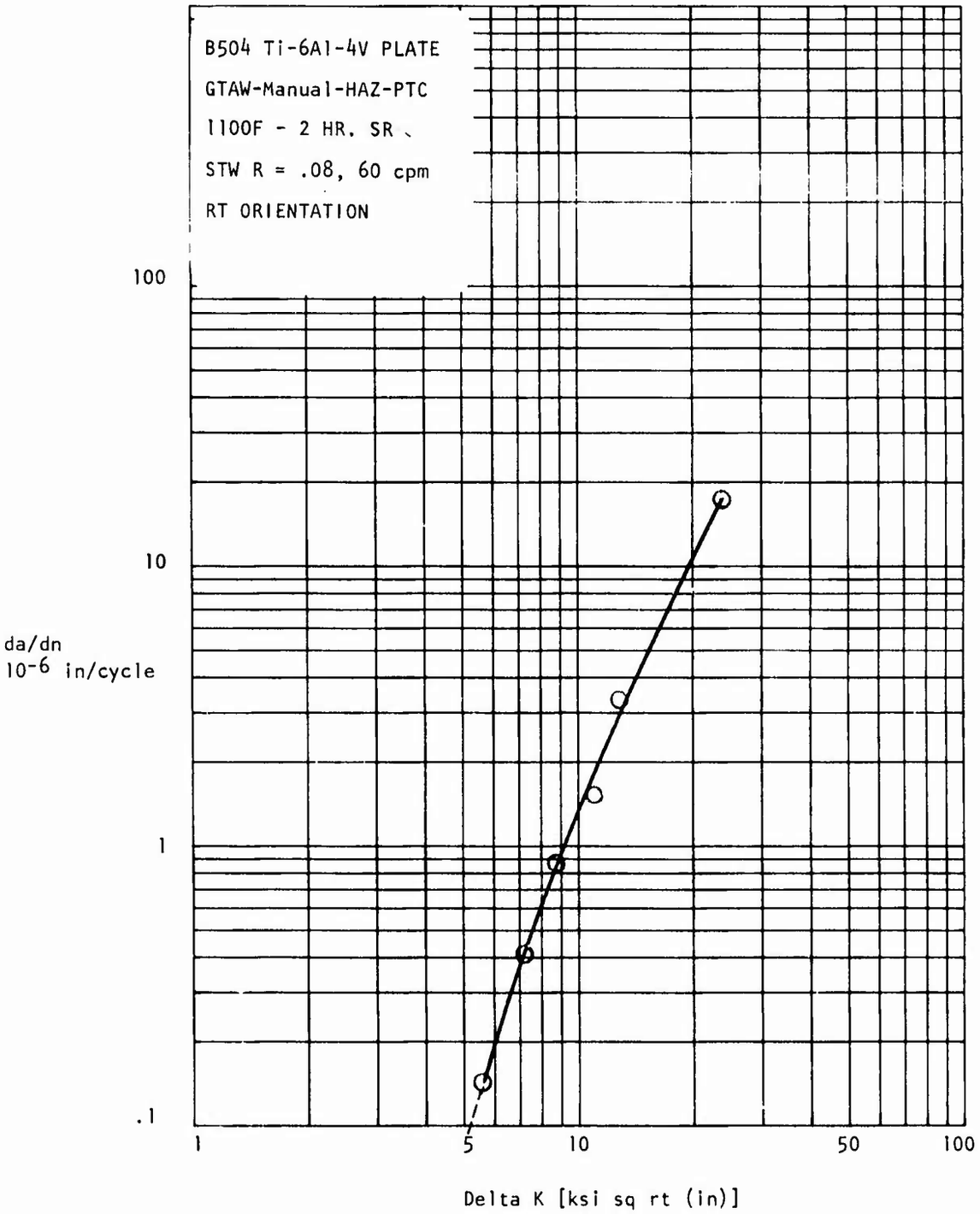


Figure 88 NRT B504 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in STW

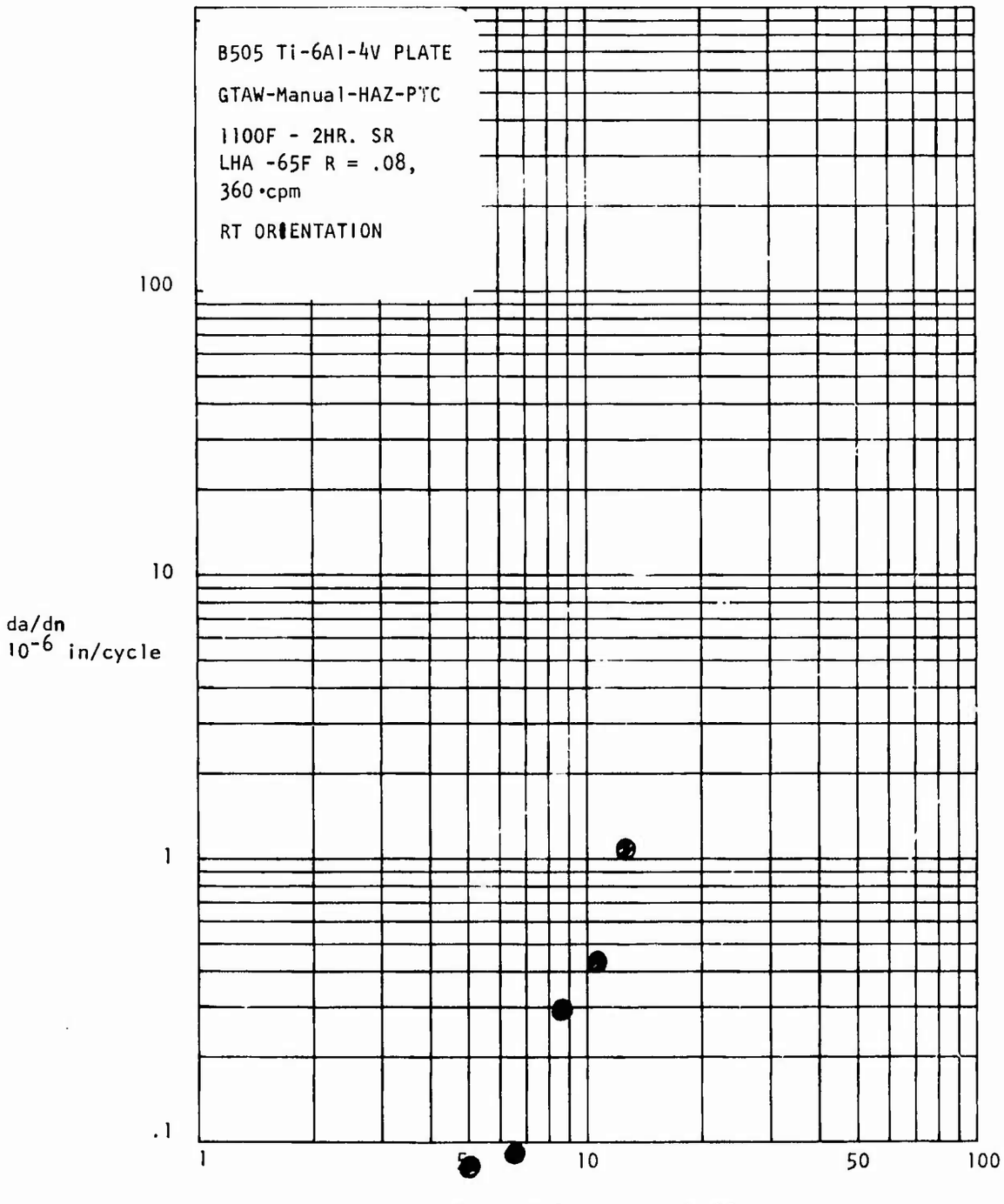


Figure 88 NRT B505 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA at -65F

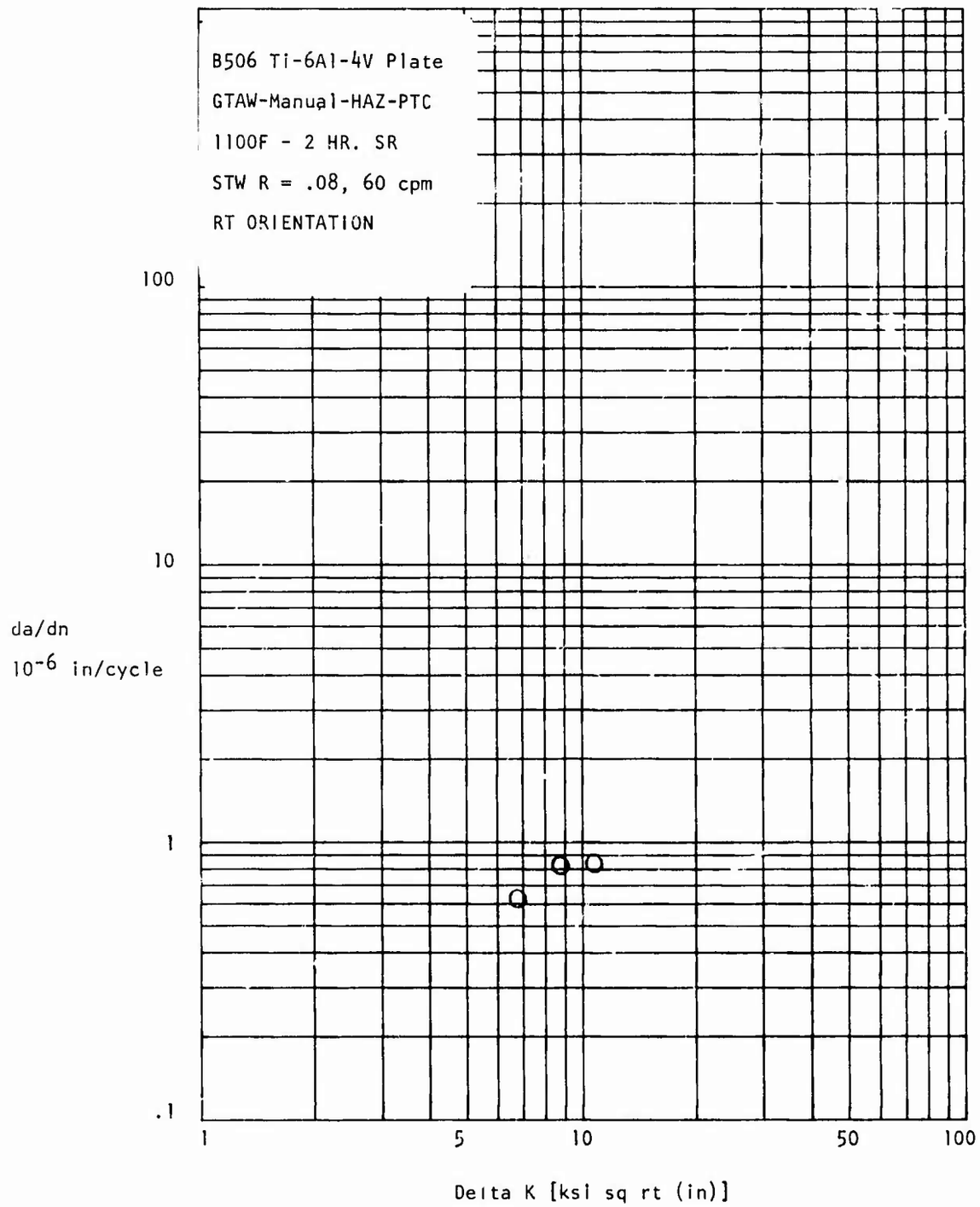


Figure 88 NRT B506 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in STW

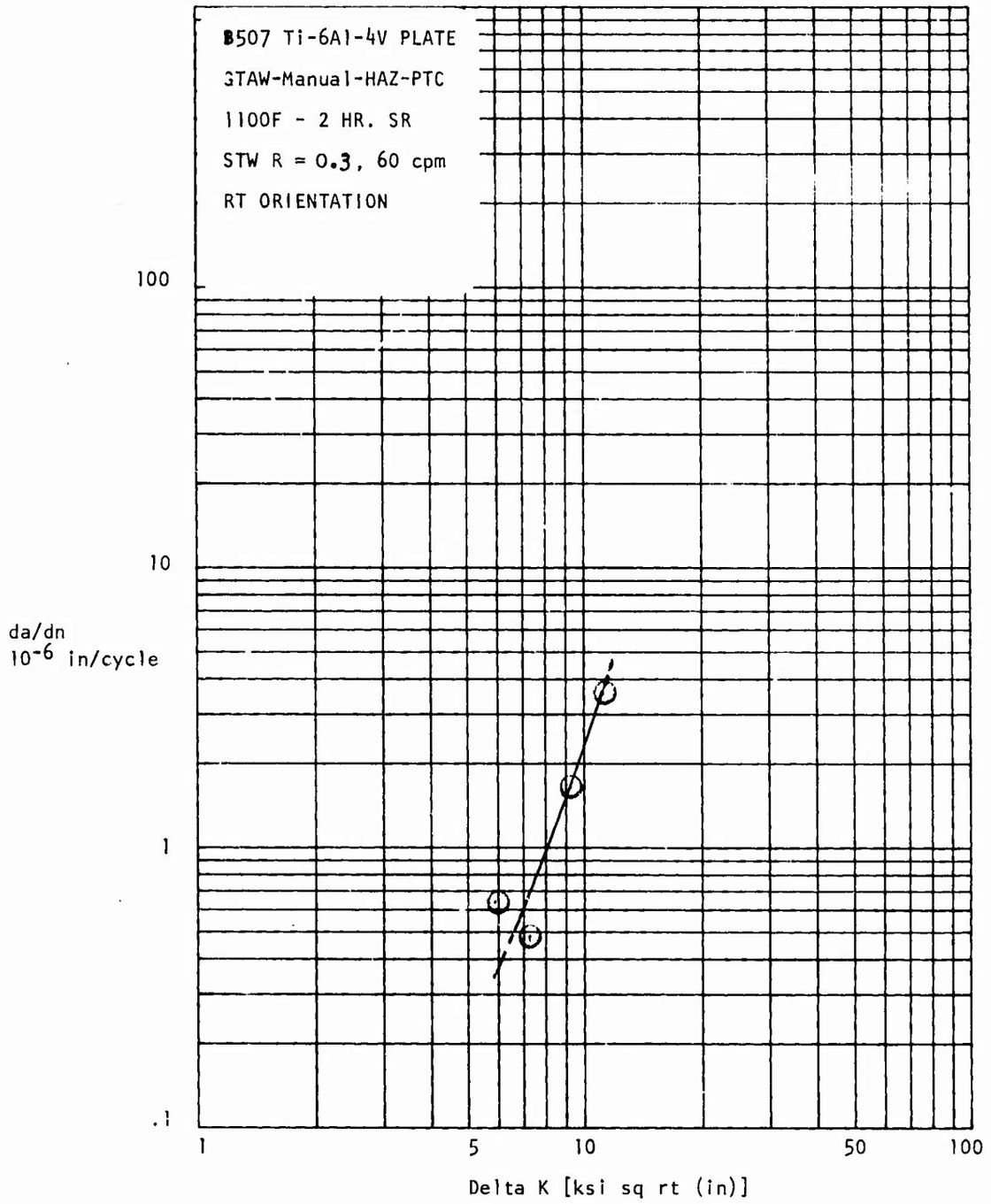


Figure 88 NRT B507 Fatigue Crack Growth Rate in the HAZ of a welded Ti-6Al-4V Plate PTC Specimen in STW

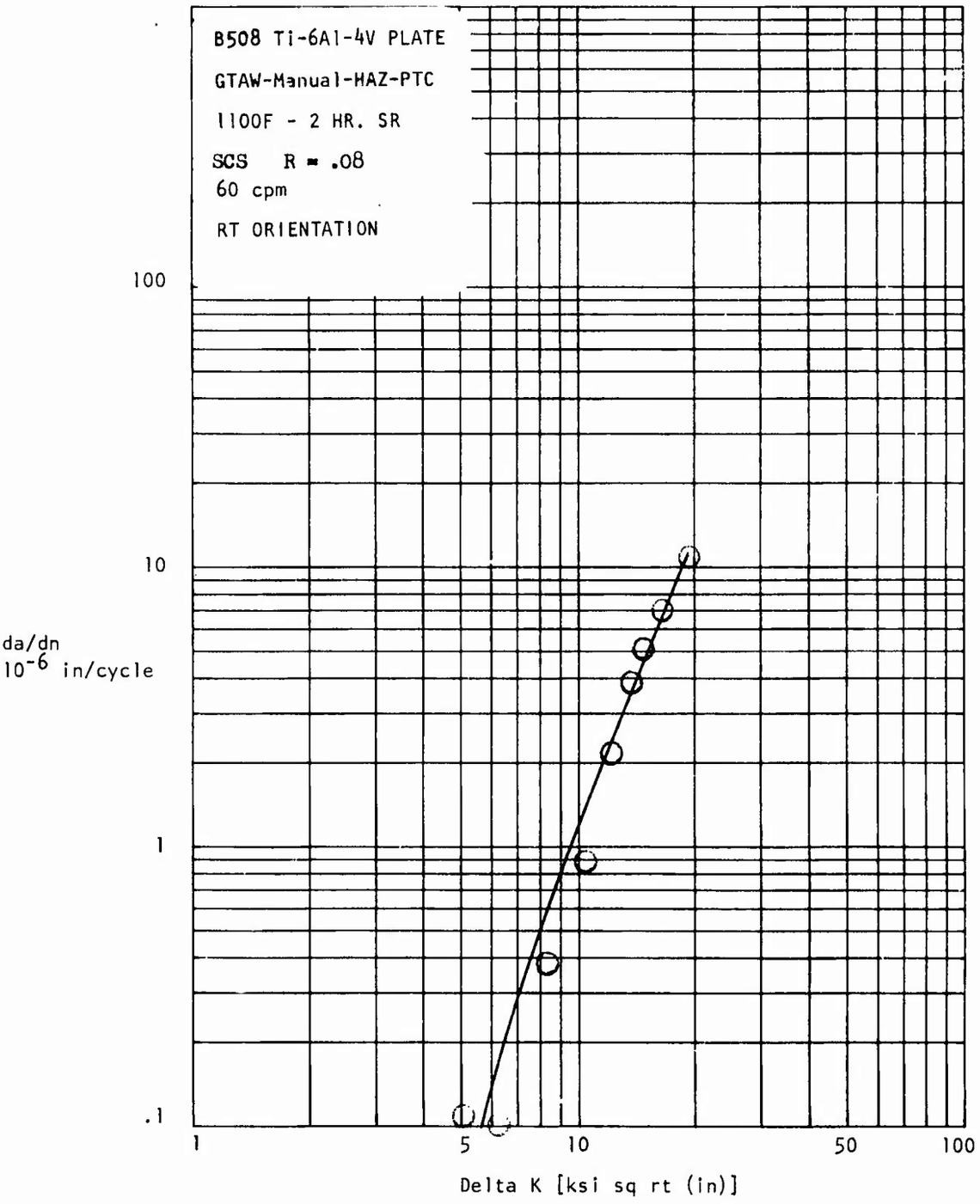


Figure 88 NRT B508 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in SCS.

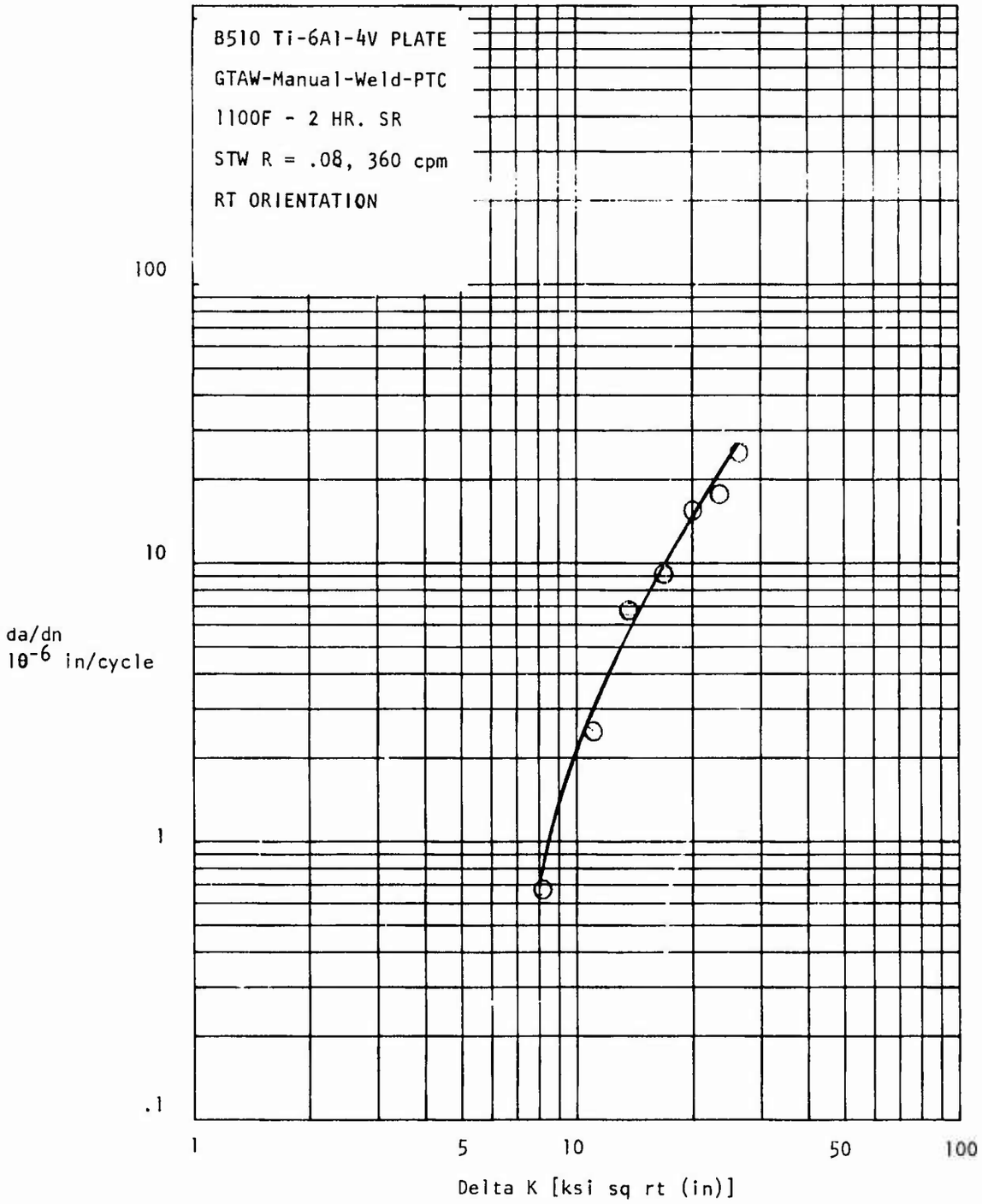


Figure 88 NRT B510 Fatigue Crack Growth Rate in the Weld Metal of Welded Ti-6Al-4V Plate PTC Specimen in STW

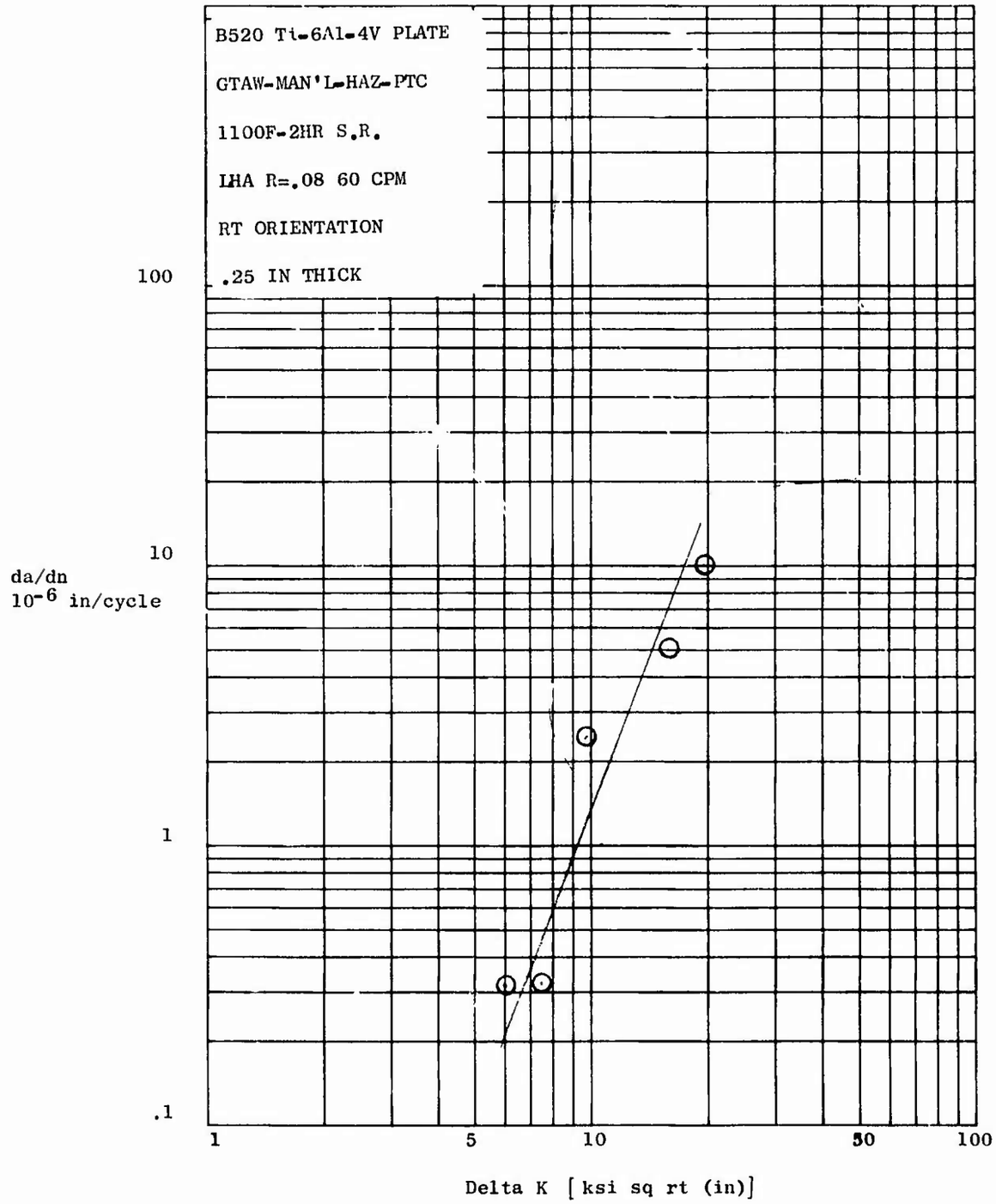


Figure 88 NRT B520 Fatigue Crack Growth Rate in the HAZ of a Welded .25 in. Thick Ti-6Al-4V Plate PTC Specimen.

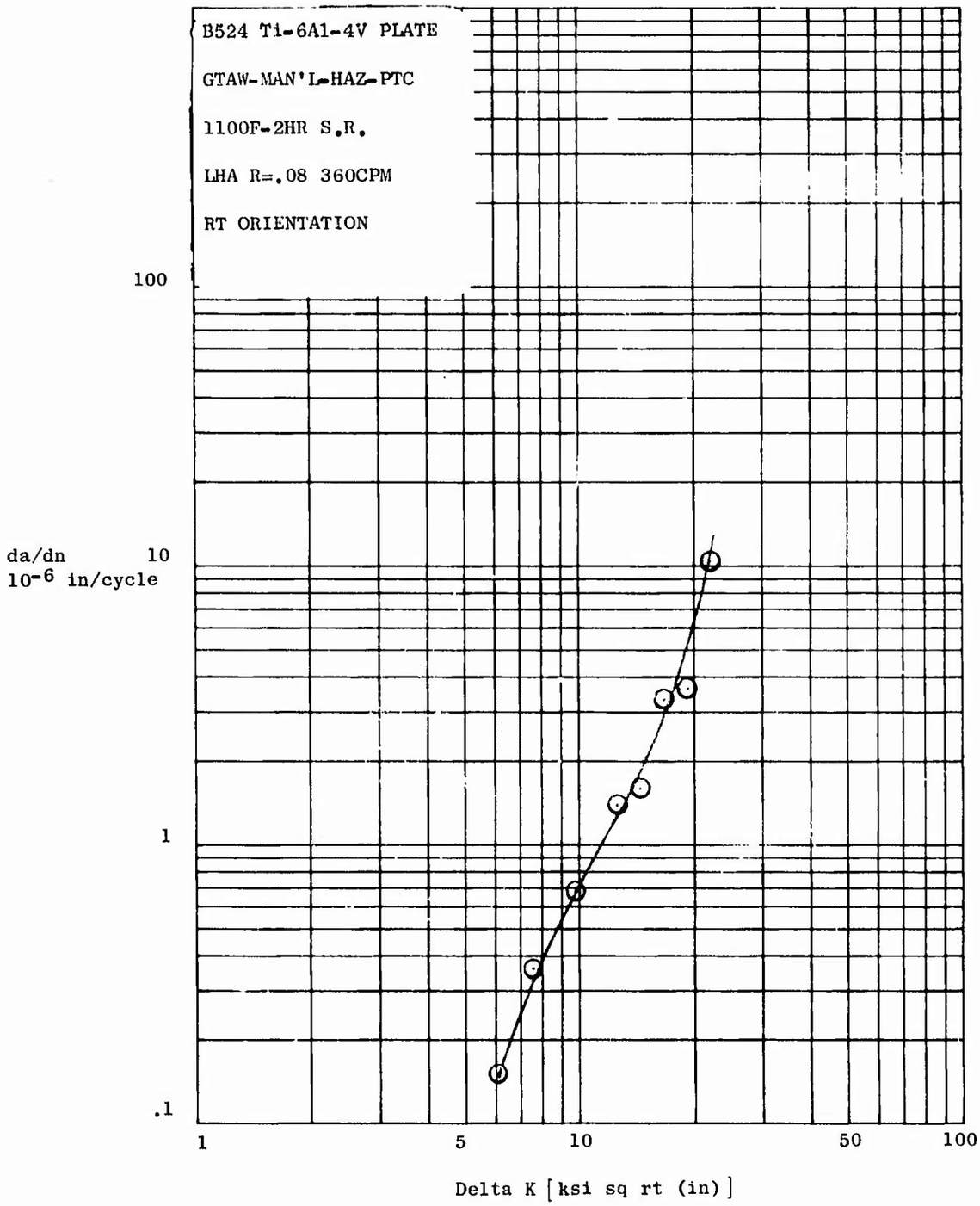


Figure 88 NRT B524 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen.

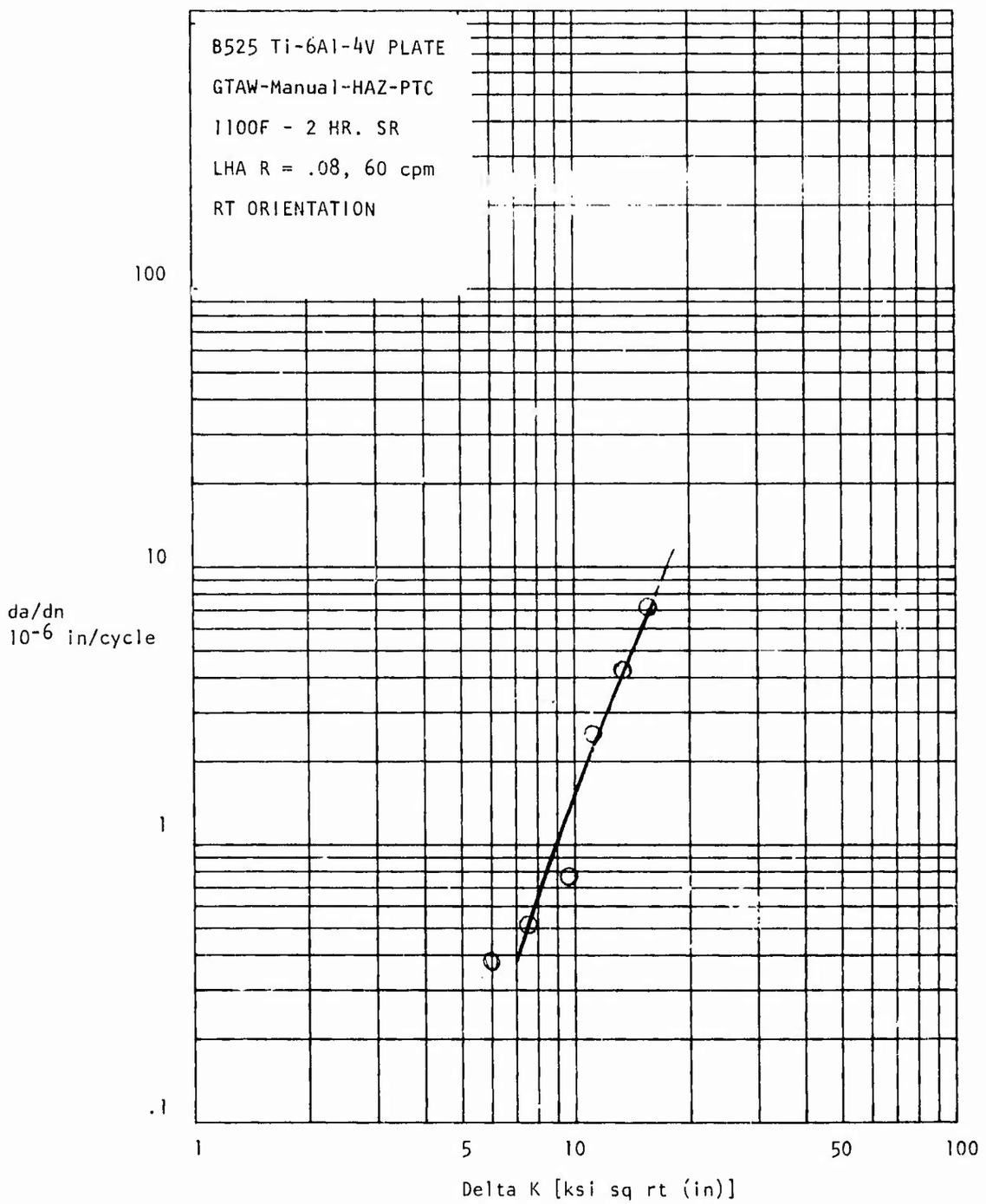


Figure 88 NRT B525 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA

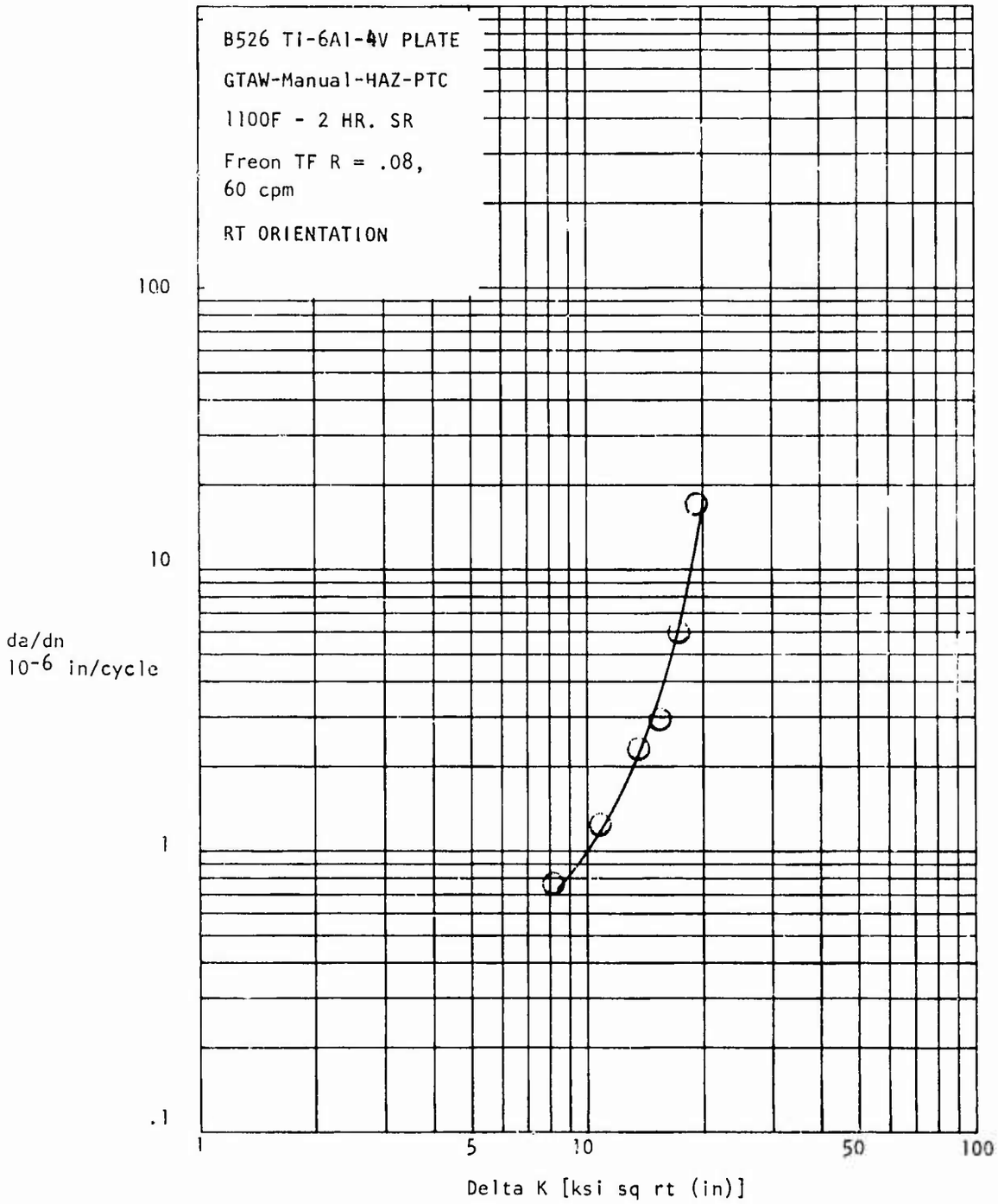


Figure 83 NRT B526 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in Freon TF

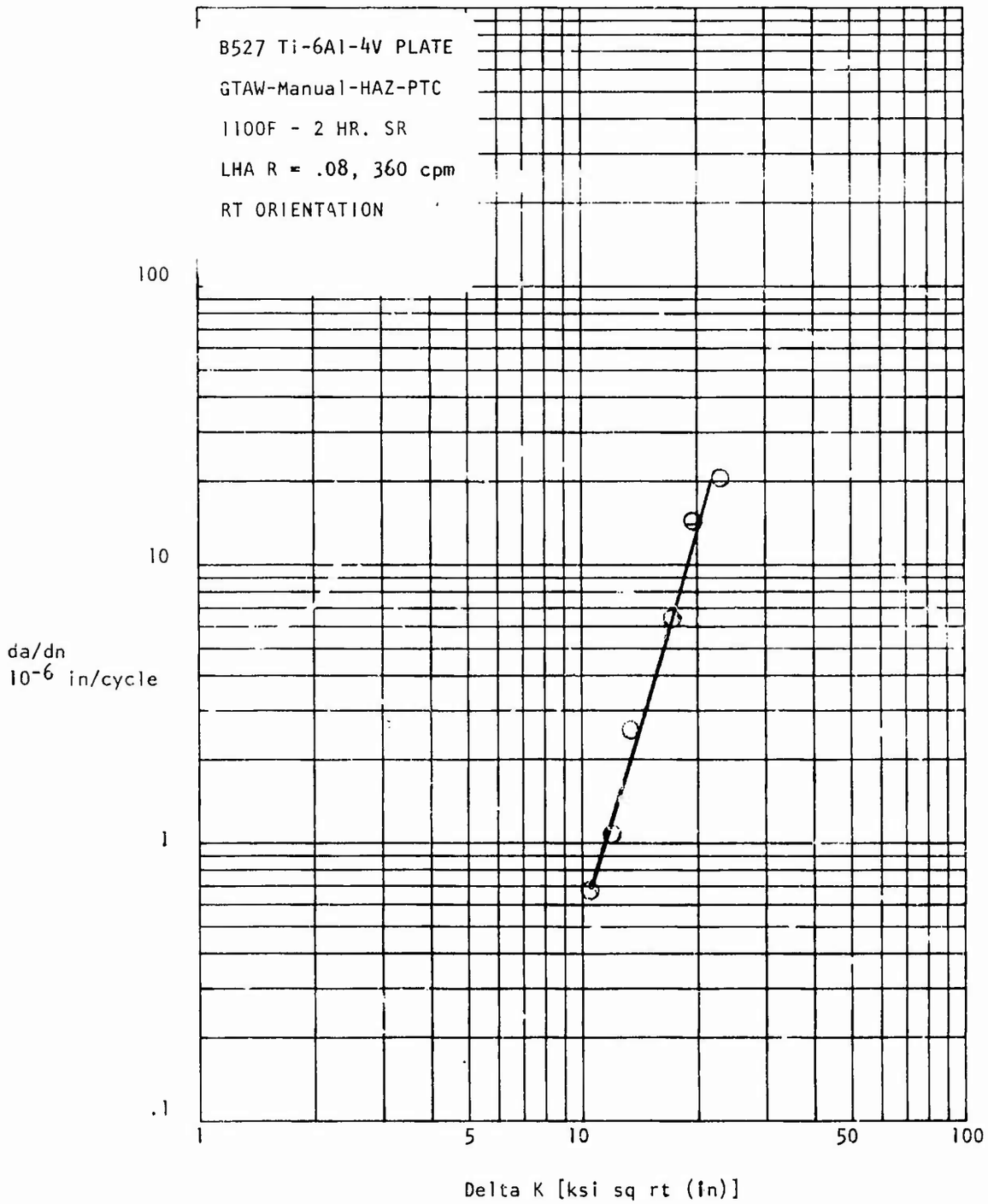


Figure 88 NRT B527 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA

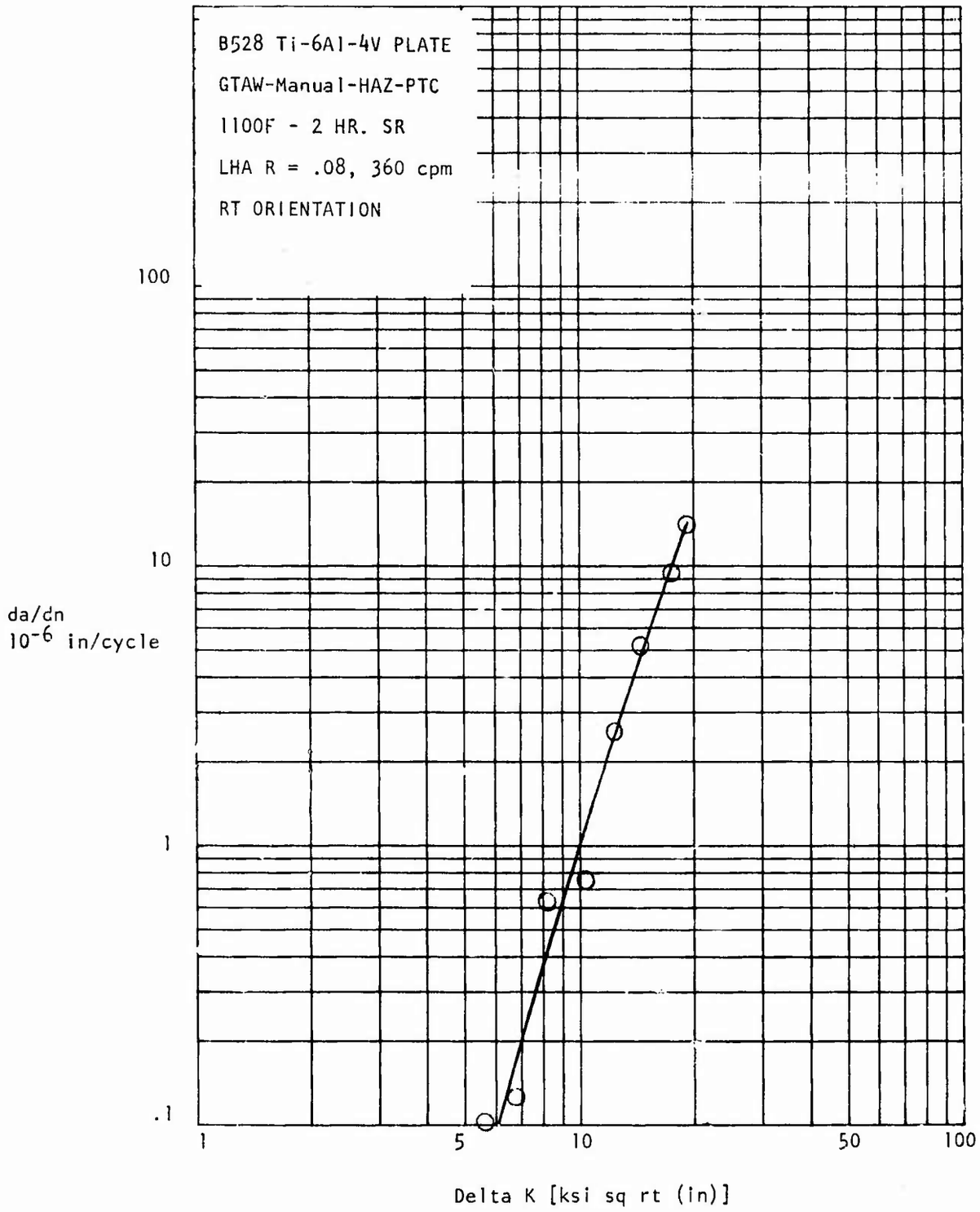


Figure 88 NRT B528 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA

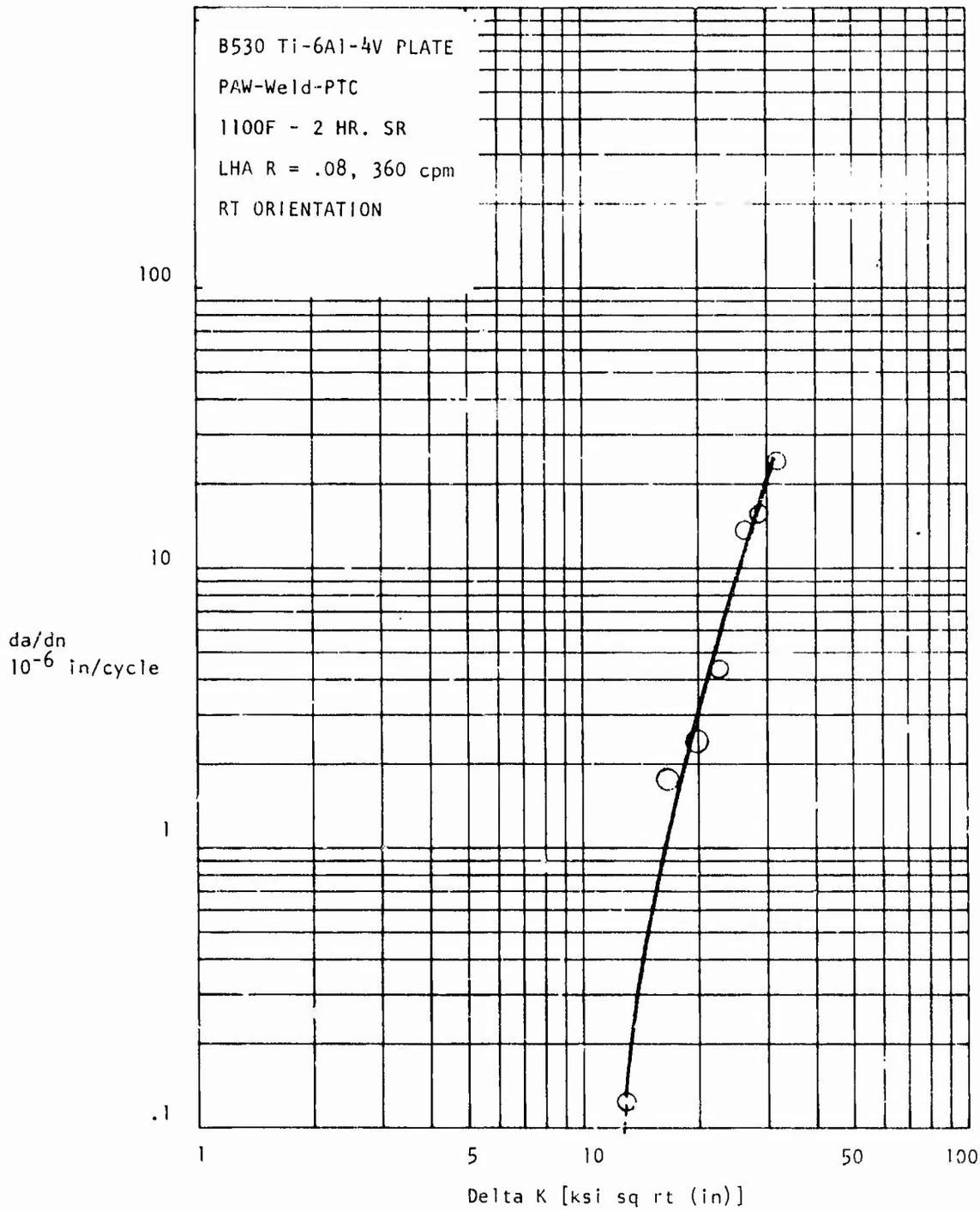


Figure 88 NRT B530 Fatigue Crack Growth Rate in the Weld Metal of a PAW Welded Ti-6Al-4V Plate PTC Specimen in LHA

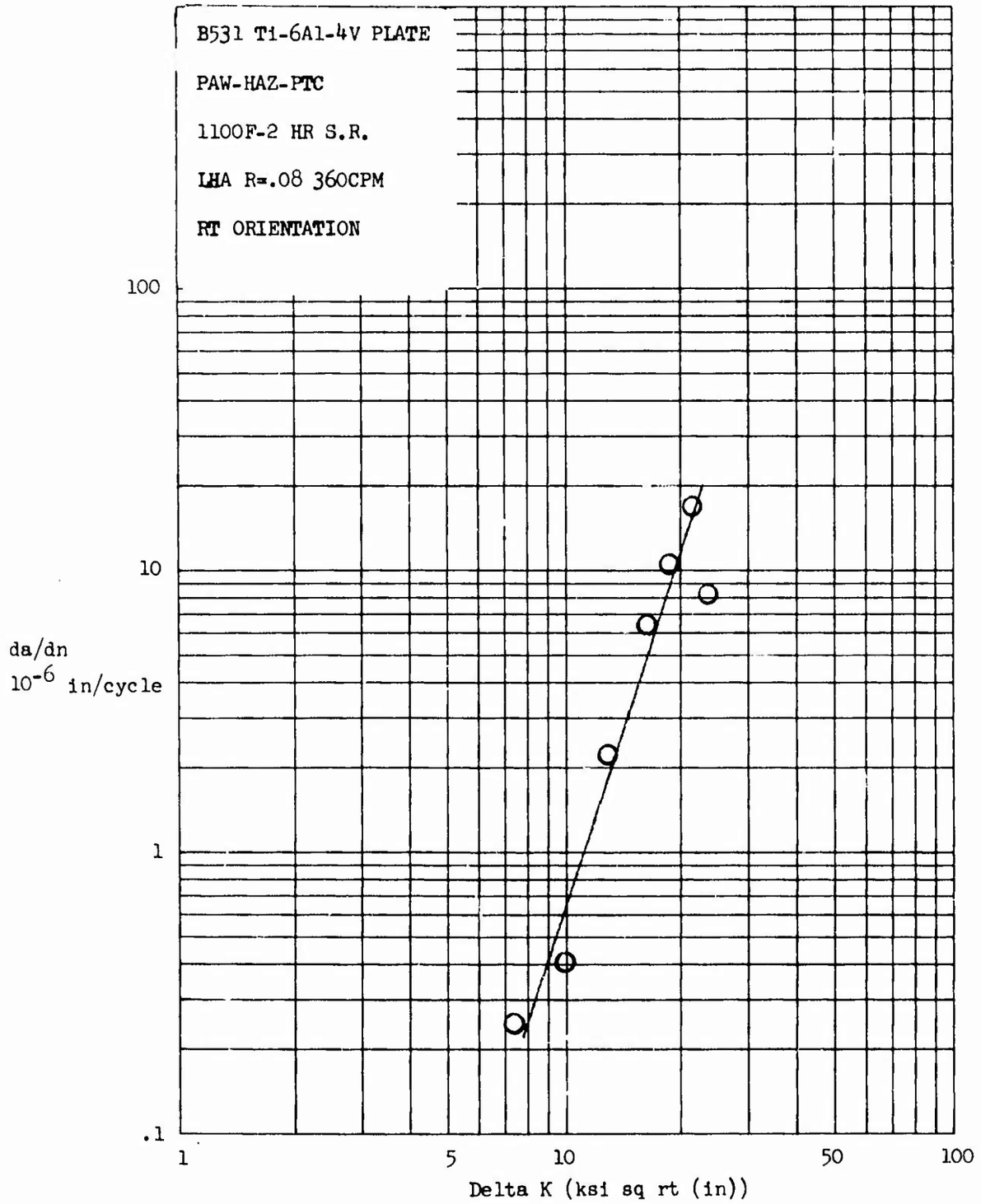


Figure 88 NRT B531

Fatigue Crack Growth Rate in the HAZ of a PAW Welded Ti-6Al-4V Plate PTC Specimen in LHA

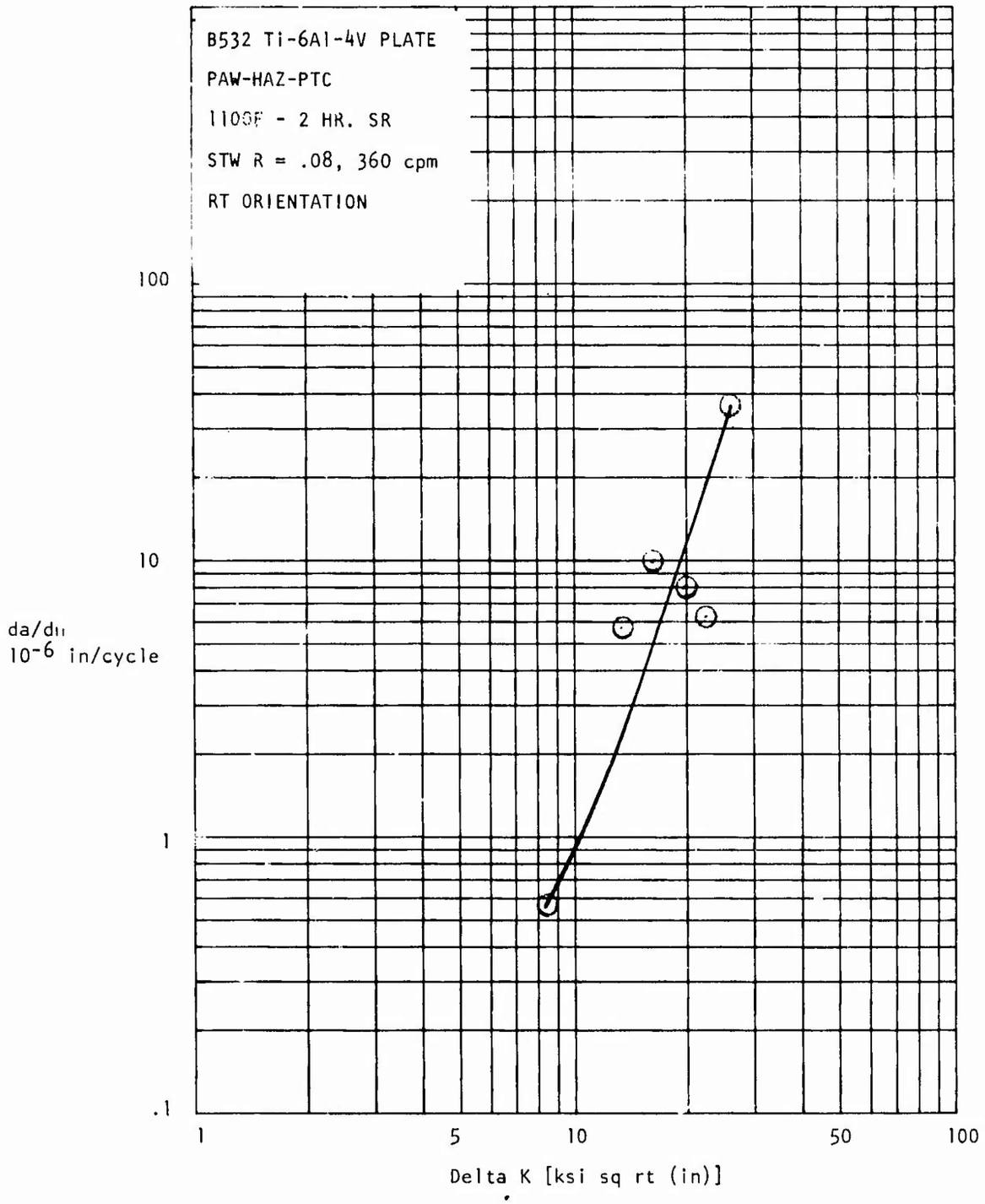


Figure 88 NRT B532 Fatigue Crack Growth Rate in the HAZ of a PAW Welded Ti-6Al-4V Plate PTC Specimen in STW

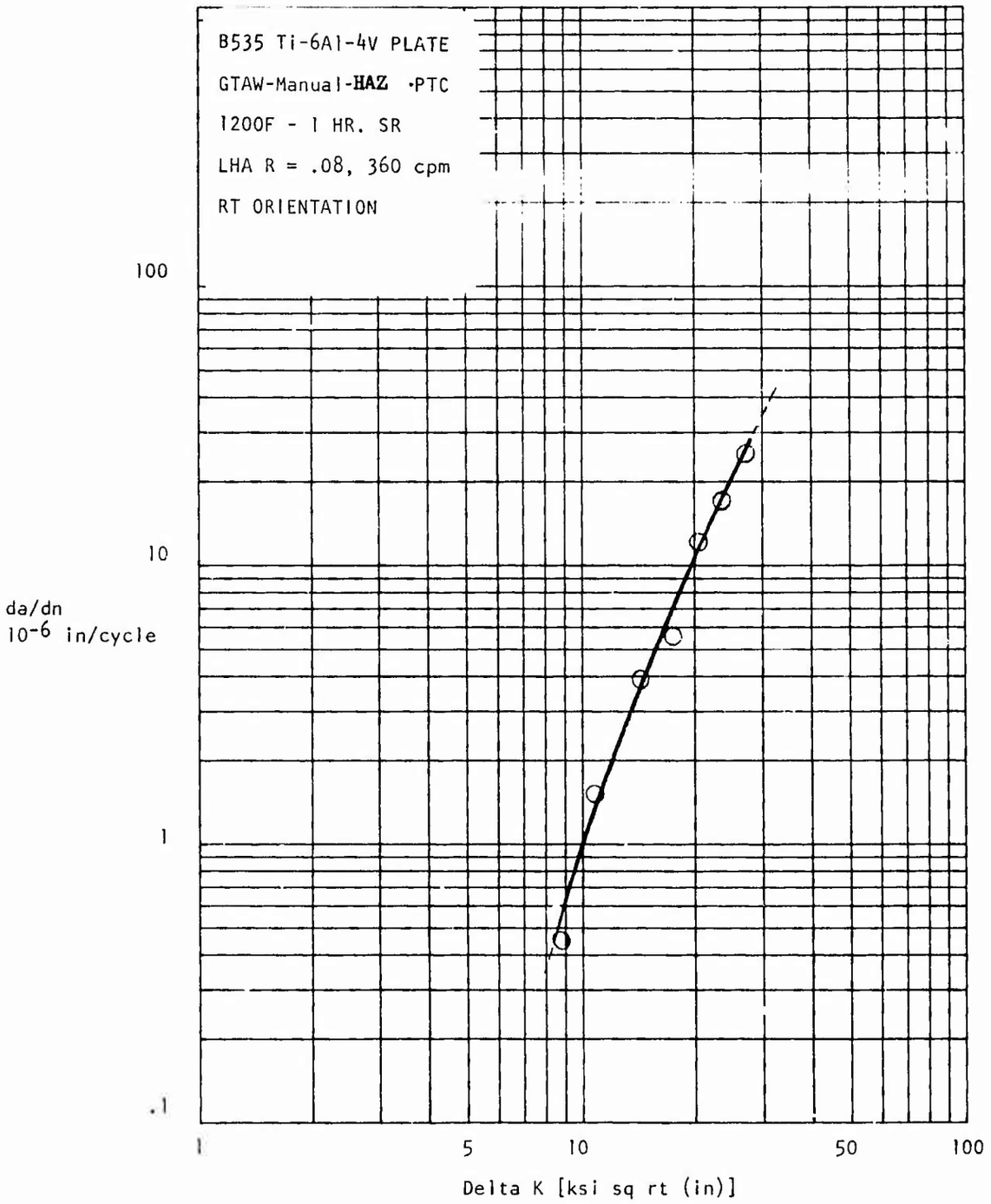


Figure 88 NRT B535 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA

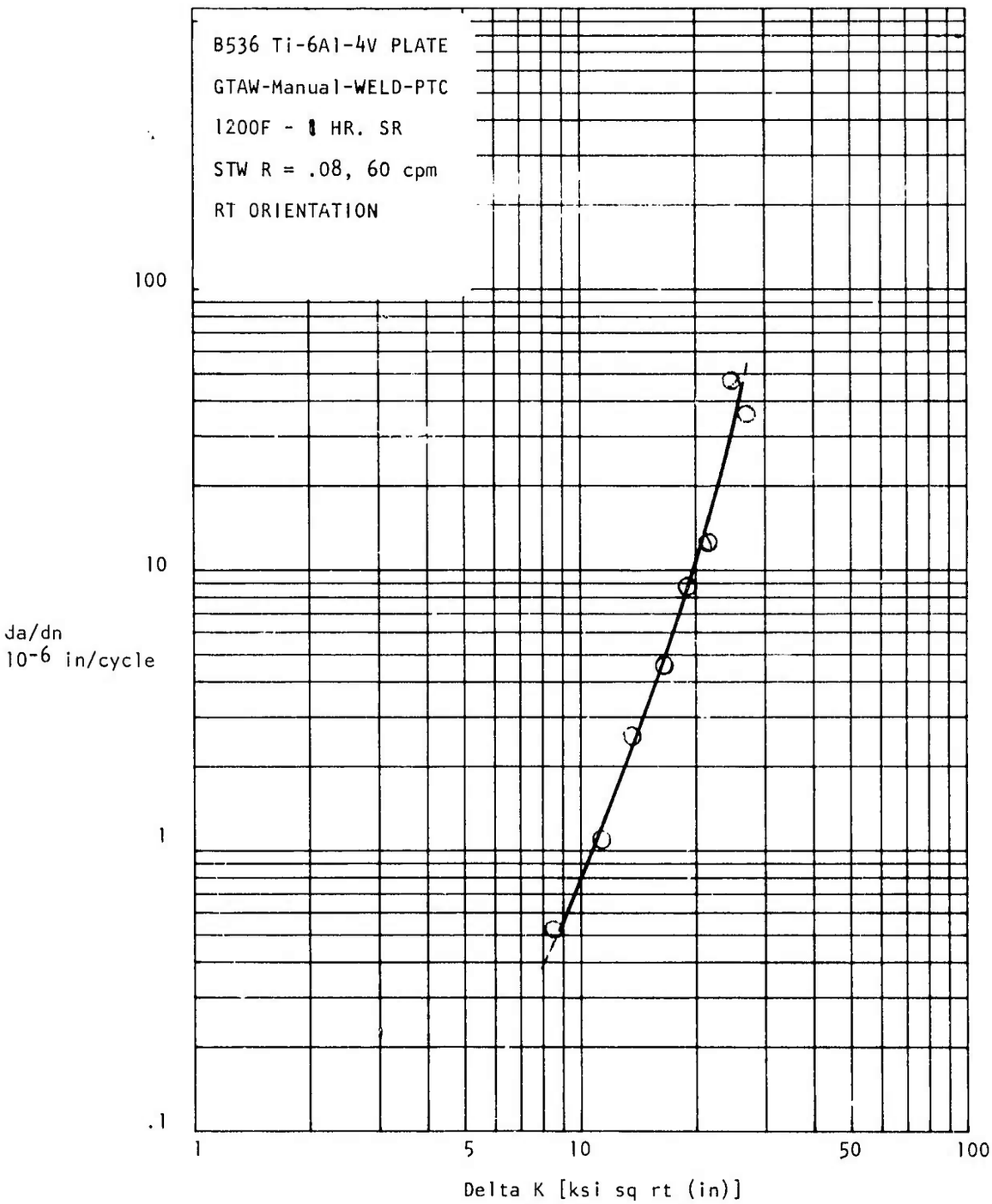


Figure 88 NRT B536 Fatigue Crack Growth Rate in the Weld Metal of a Welded Ti-6Al-4V Plate PTC Specimen in STW

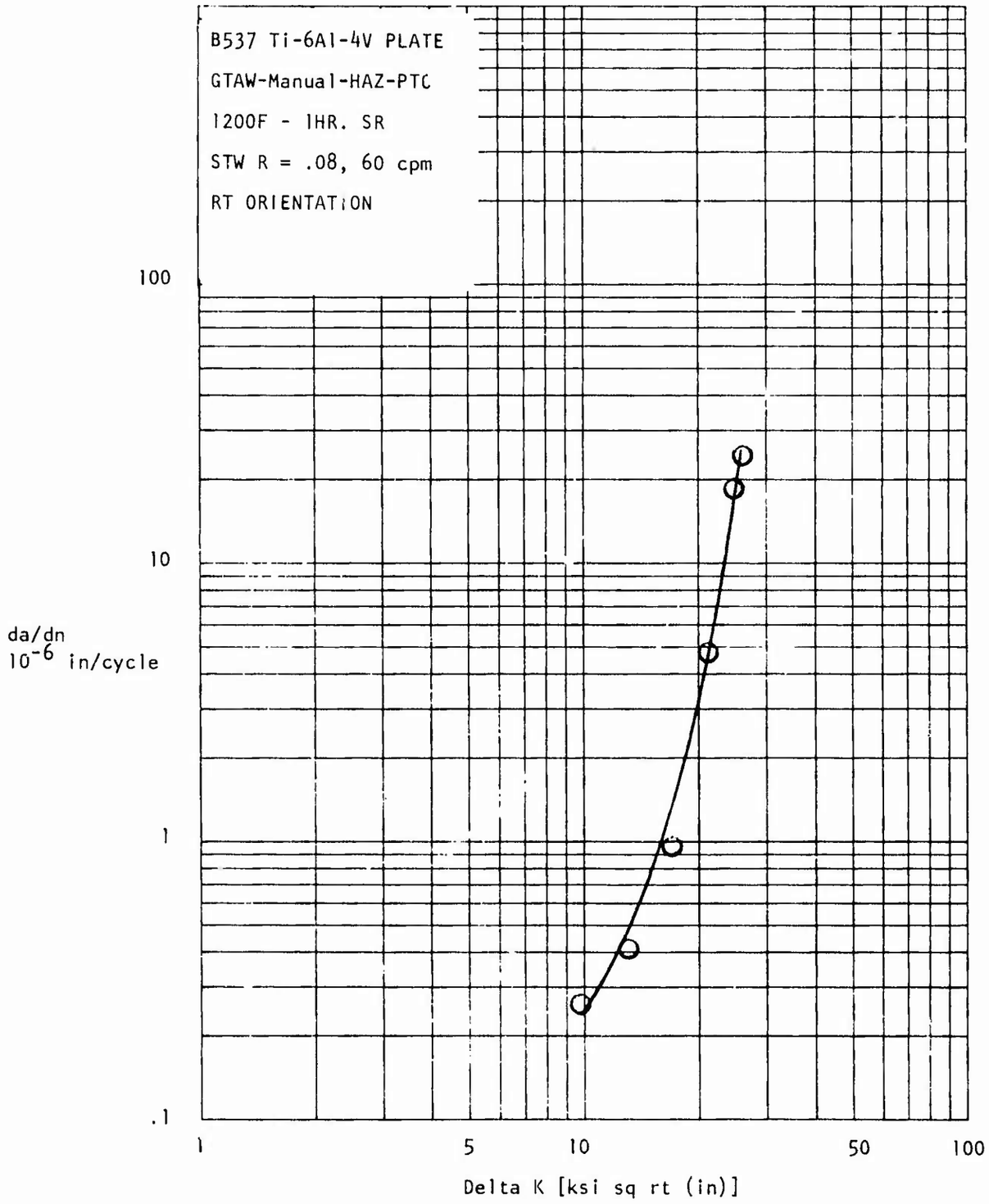


Figure 88 NRT B537 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in STW

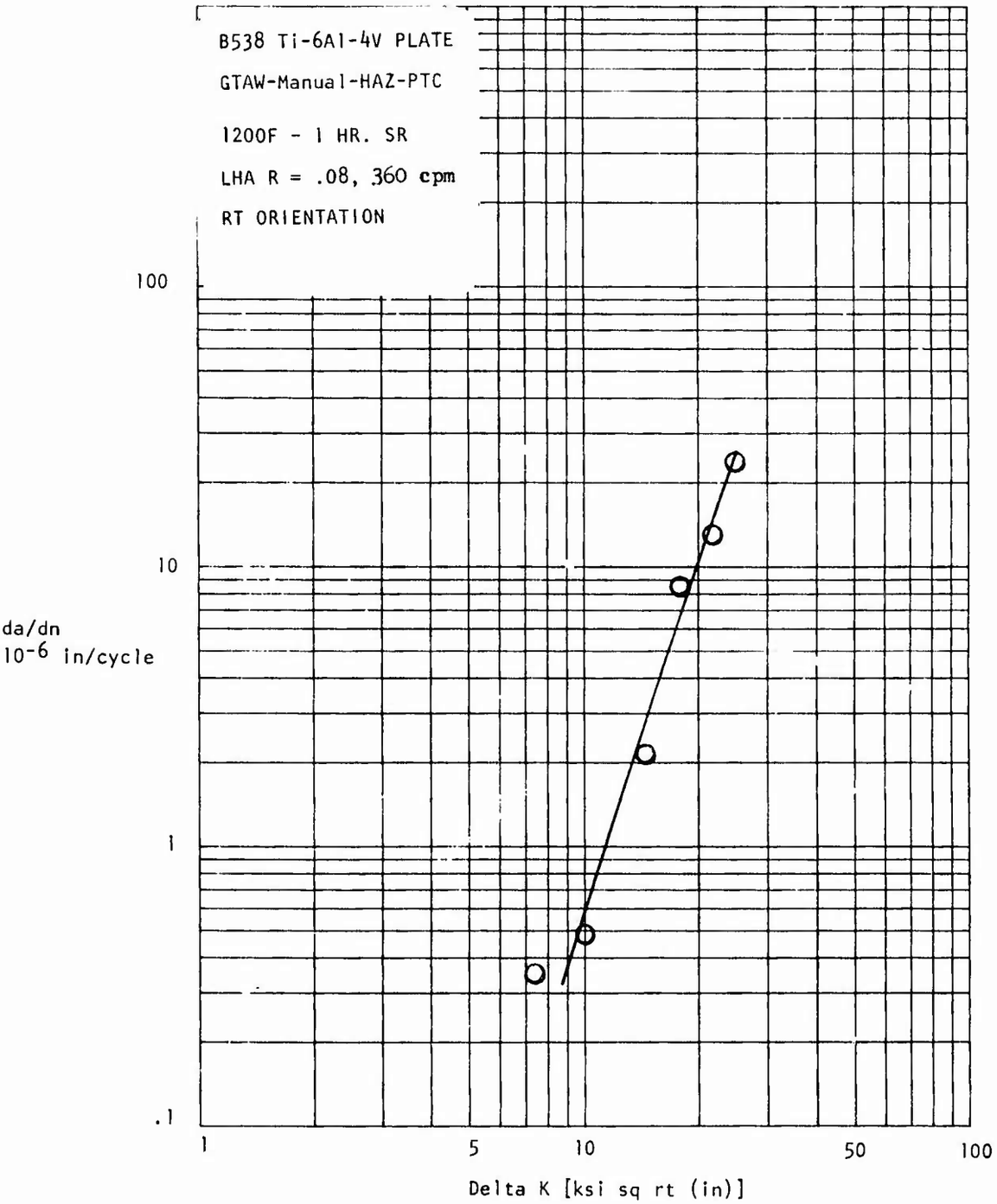


Figure 88 NRT B538 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA

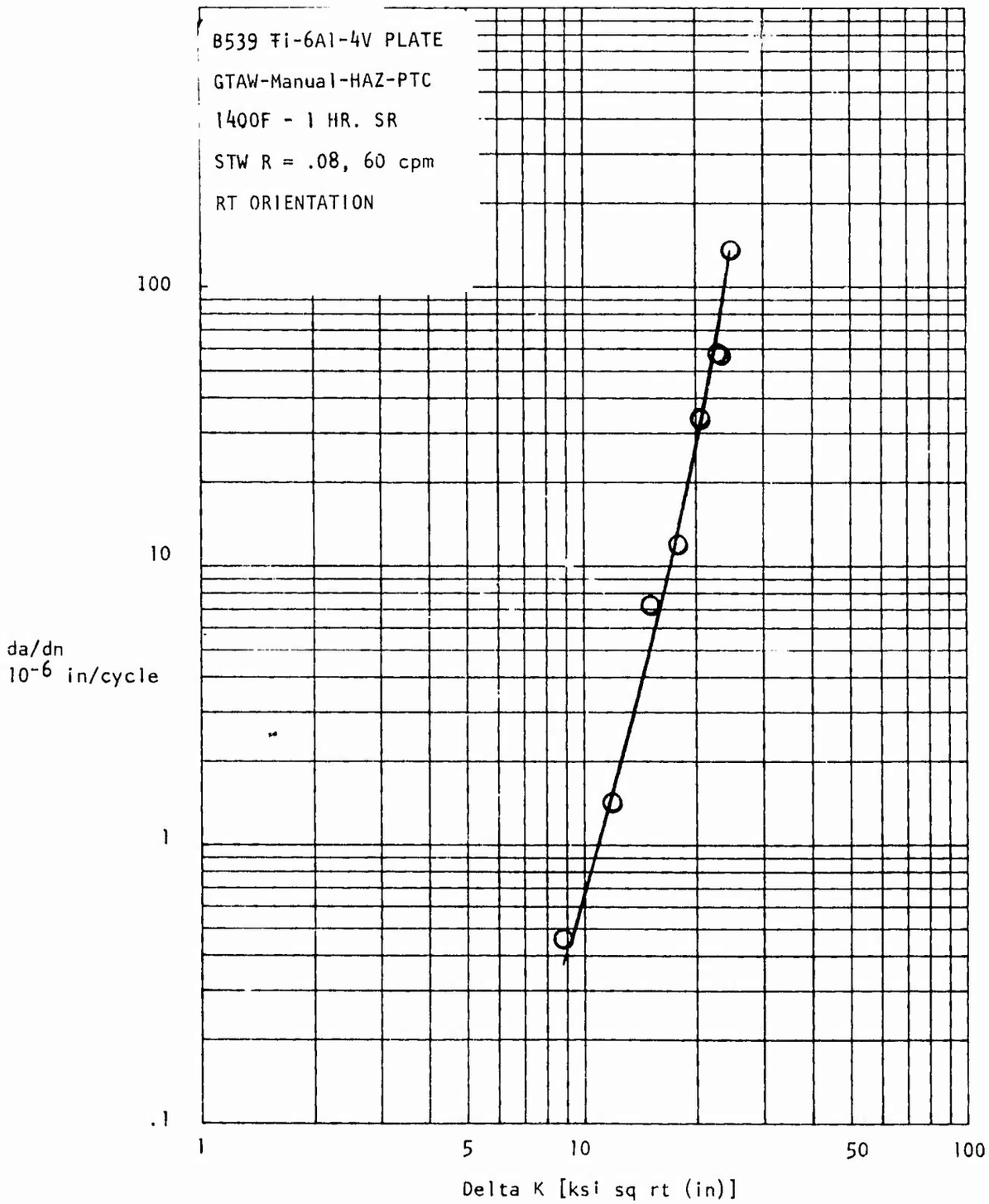


Figure 88 NRT B539 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in STW

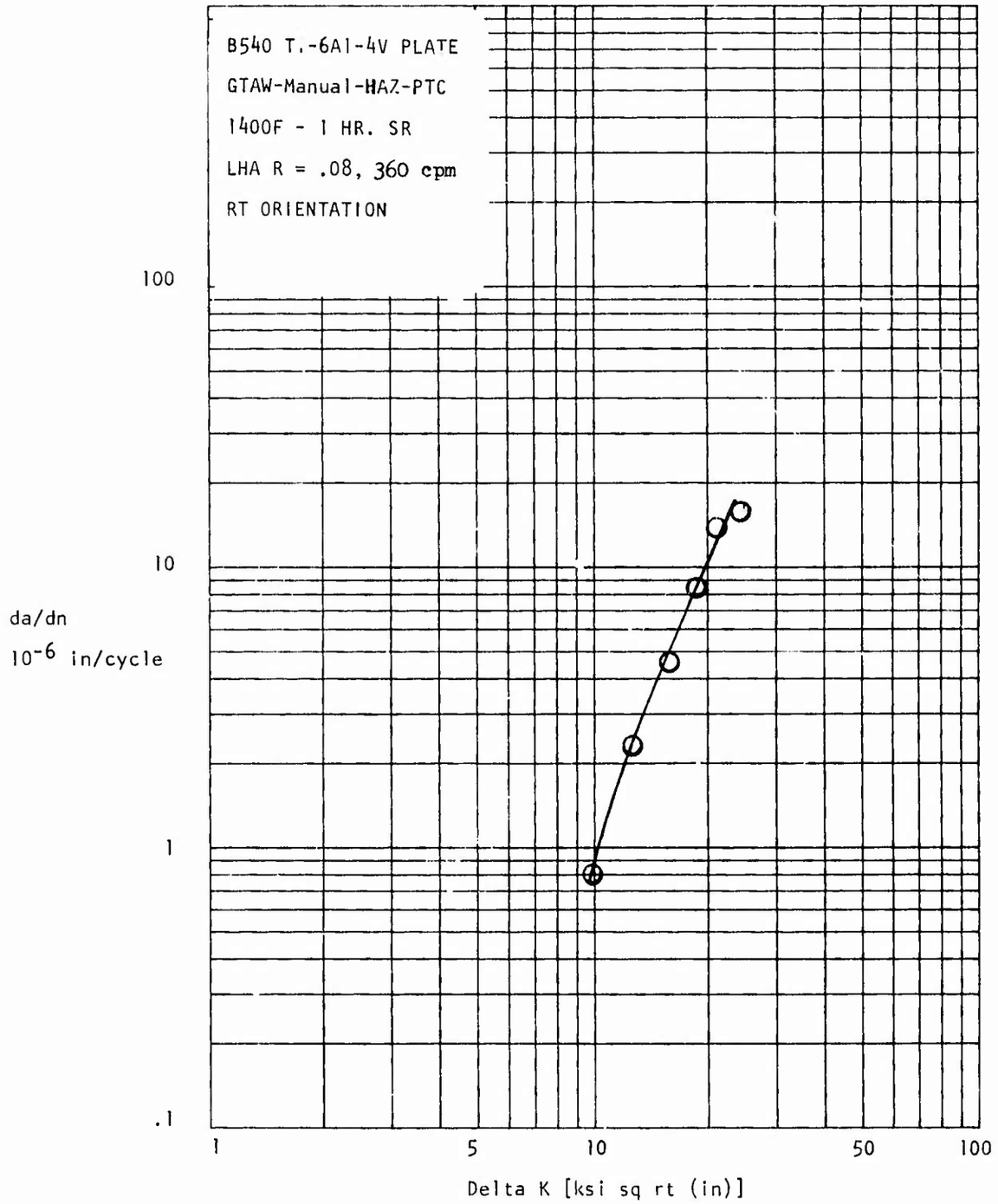


Figure 88 NRT B540 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA

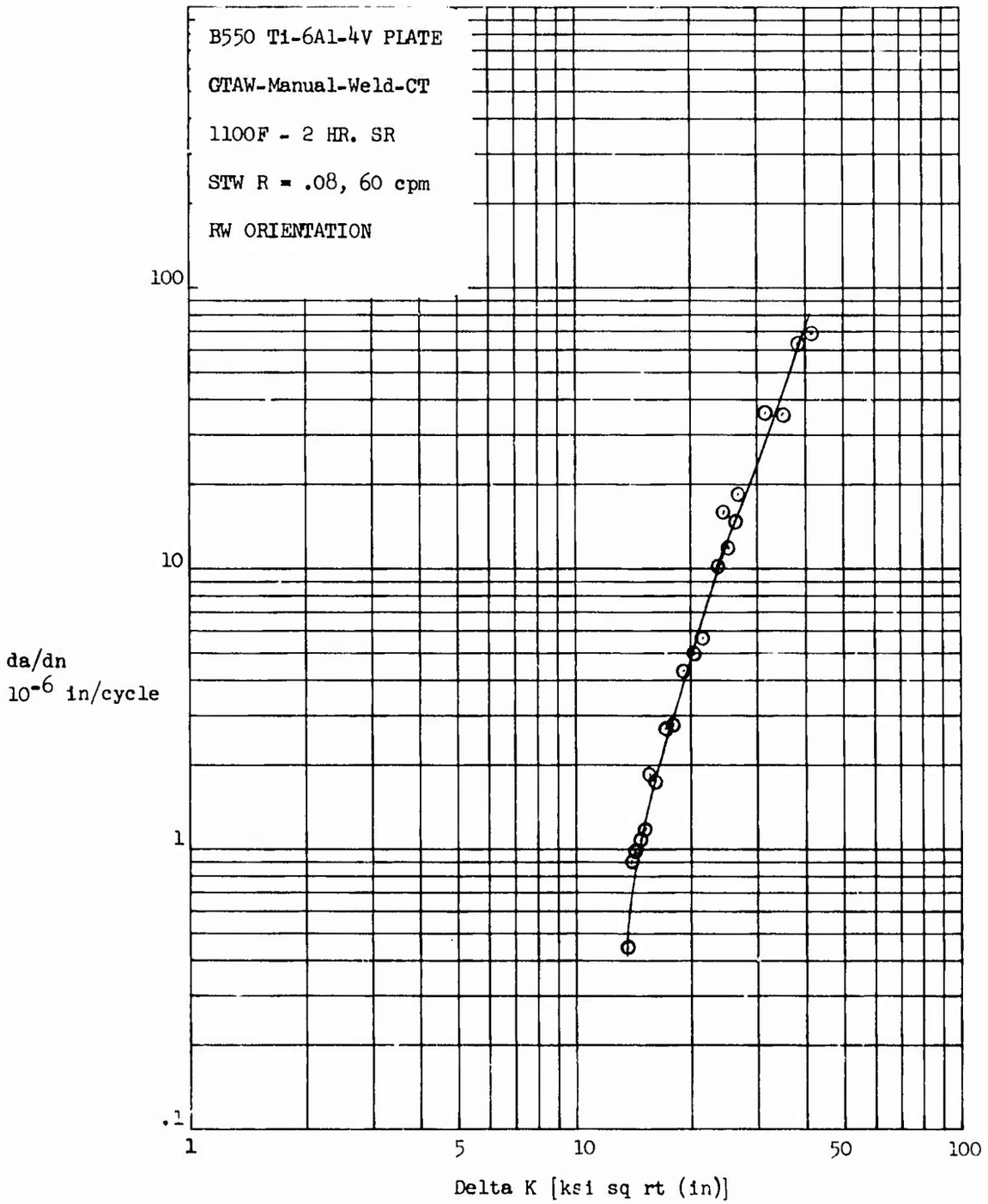


Figure 88 NRW B550 Fatigue Crack Growth Rate in the Weld Metal of a Welded Ti-6Al-4V Plate CT Specimen in STW

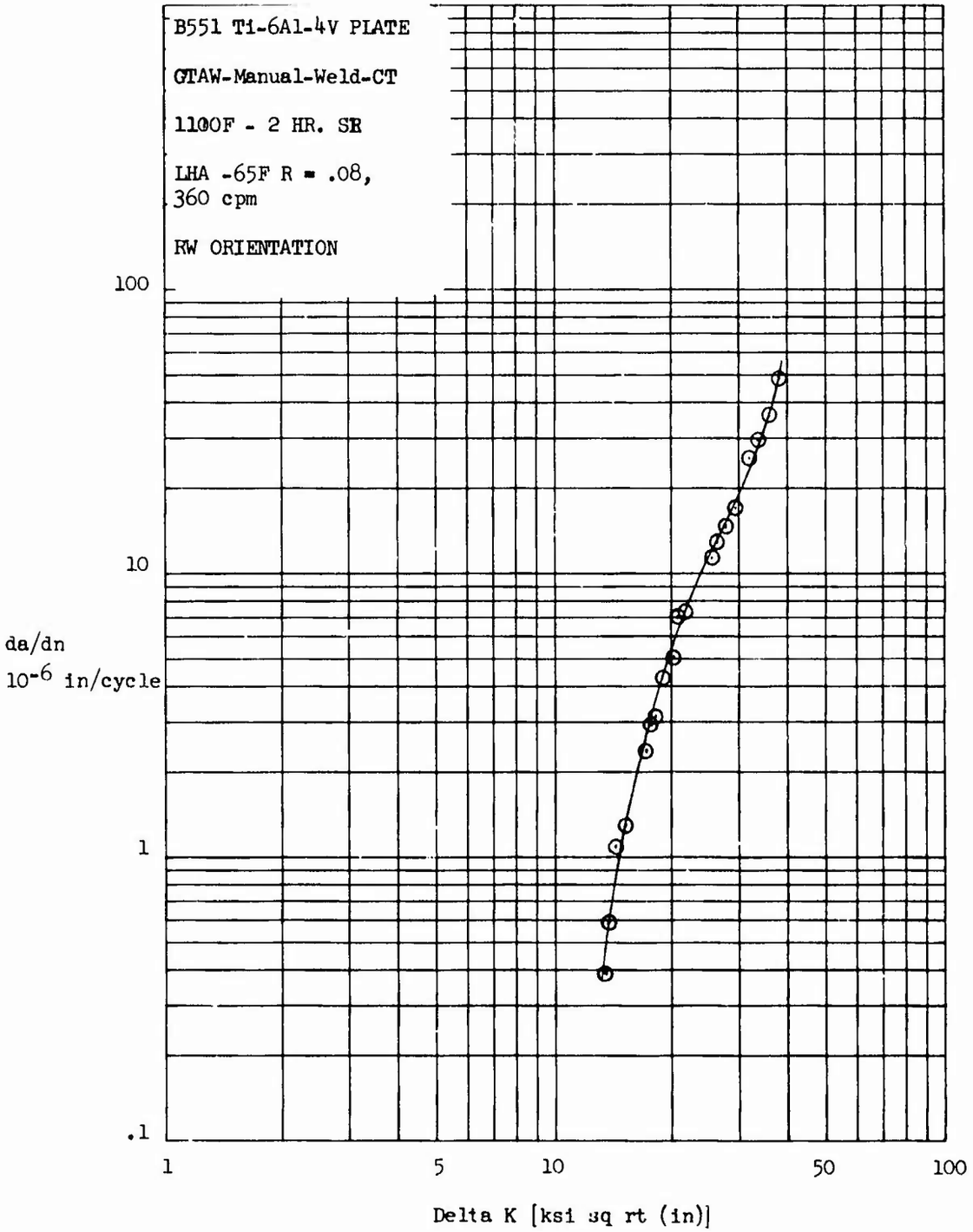


Figure 88 NRW B551 Fatigue Crack Growth Rate in the Weld Metal of a Welded Ti-6Al-4V Plate CT Specimen in LHA

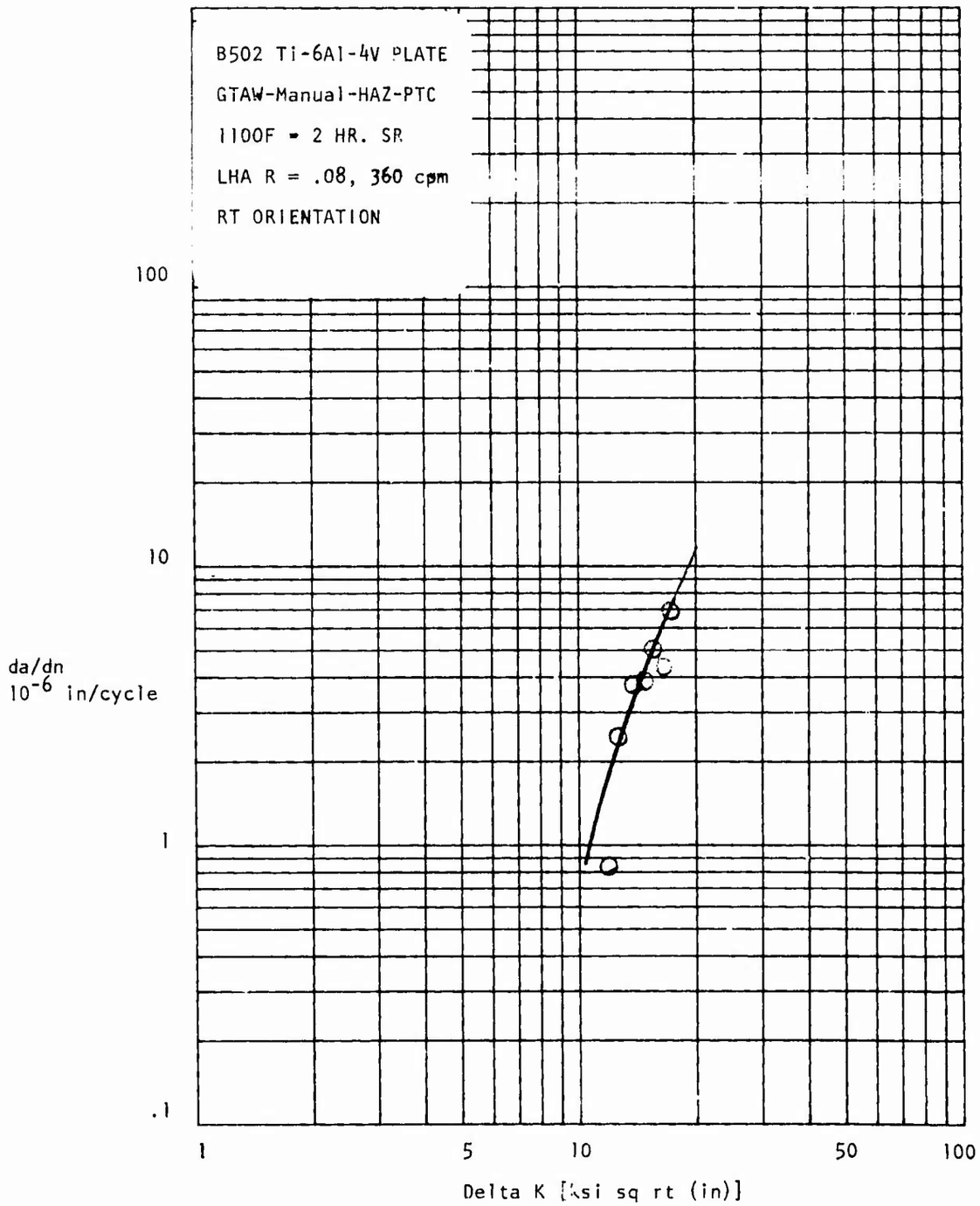


Figure 89 NRT B502 Fatigue Crack Growth Rate in the HAZ of a Welded Ti-6Al-4V Plate PTC Specimen in LHA