AD-A185 857 DEVELOPMENT OF FTMS METHODS FOR THE DETECTION OF TRACE CHEMICAL SPECIES A.. (U) FLORIDA UNIV GAINESVILLE DEPT OF CHEMISTRY J R EYLER 29 SEP 87 1/1

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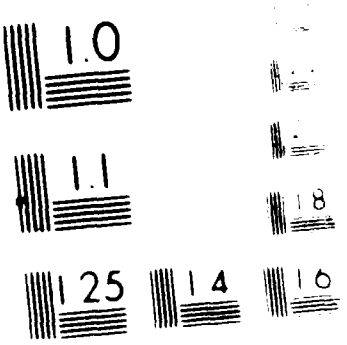
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CUMENTATION PAGE

(FTICR) Mass Spectrometry
chemical species, including
photodissociation
structures, and laser
ionization ... both

DD FORM 1473

FINAL REPORT

Contract #N00014-82-K-0509

"Development of FTMS Methods for the Analysis of Various Chemical Species"

The primary goal of this contract was to investigate and develop new methods of analysis which exploit the many advantages of Fourier transform ion cyclotron resonance (fticr) mass spectrometry. Initially, studies aimed at miniaturizing the fticr mass spectrometer were carried out. One technical report (#11) resulted from this work, which was "spun off" to the private sector with continued support from a small instrument company which is now close to developing a prototype miniaturized mass spectrometer. Additional work was carried out to demonstrate the feasibility of studying different classes of compounds using fticr mass spectrometry, including organometallic species (#'s 1 and 12). A majority of the work during the contract period concentrated on using lasers to form ions in the fticr mass spectrometer via laser desorption and to analyze the structures of the ions formed (#2, 4, 6, 7, 8, and 10). Although mainly supported by another contract, some work was carried out on reactions of small hydrocarbon ions which might be important in soot formation (#9). Finally, one stated goal of the contract was to interact and carry out collaborative research with scientists at Navy laboratories, especially the Naval Research Laboratory. This resulted in two publications (#'s 3 and 8).

TECHNICAL REPORTS

(All publications resulting from this contract were issued, either in preprint or reprint form, as technical reports).

Number	Title
1	"Gas-Phase Electron Transfer: Kinetics of Metallocene Self-Exchange Reactions".
2	"Infrared Multiphoton Dissociation of Some Oxygen-Containing Hydrocarbon Ions. Differentiation of Isomeric Ion Structures in the Gas Phase".
3	"Formation of the Protonated Dimer of Hexahydro-1,3,5-trinitro-1,3,5-triazine by Complex Switching Reactions".

TECHNICAL REPORTS (continued)

Number	Title
4	"Infrared Multiphoton and Collision Induced Dissociation Studies of Some Gaseous Alkylamine Ions".
5	"Fourier Transform Ion Cyclotron Resonance Mass Spectrometry".
6	"Photodissociation of Gaseous Ions Formed by Laser Desorption".
7	"Infrared Multiphoton Dissociation of the Nitrobenzene Cation".
8	"FTMS Studies of Mass Selected, Large Cluster Ions Produced by Direct Laser Vaporization".
9	"Reactions of $C_3H_3^+$ with Acetylene and Diacetylene in the Gas Phase".
10	"Formation of Gold Cluster Cations by Direct Laser Vaporization".
11	"Fourier Transform Ion Cyclotron Resonance Mass Spectrometry at Low Magnetic Fields: Several Figures of Merit".
12	"Gas-Phase Electron Transfer: Thermal Self-Exchange and Cross Reactions of Organometallic Molecules and Ions".

PERSONNEL WORKING ON CONTRACT

Principal Investigator: Professor John R. Eyler

Postdoctoral Associates: Dr. M. G. Baykut
Dr. M. Moini
Dr. C. H. Watson
Dr. R. R. Weller

Graduate Research Assistants: Ms. F. Ozturk
Mr. C. H. Watson

Undergraduate Research Assistants: Mr. M. Esposito

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