FLOWING AFTERGLOW STUDIES OF THE TEMPERATURE DEPENDENCIES FOR DISSOCIATIVE RECOMBINATION OF $O_2^+$, $CH_5^+$, $C_2H_5^+$, AND $C_6H_7^+$ WITH ELECTRONS.

J. L. MCLAIN, V. POTERYA, C. D. MOLEK, and N. G. ADAMS, *Department of Chemistry, University of Georgia, Athens, GA 30602, USA*; R. PLASIL, *Charles University, Prague, Czech Republic*.

A temperature variable flowing afterglow is being used with an electrostatic Langmuir probe to determine the recombination rate coefficients for ions such as $O_2^+$, $CH_5^+$, $C_2H_5^+$, and $C_6H_7^+$ with electrons at temperatures ranging from 80 to 600 K. This is being extended to other hydrocarbon ions. The data available at present indicate recombination rate coefficients are large and exhibit significant dependencies on temperature in accord with the simple direct and indirect mechanisms. The dissociative recombination of many of these ions is important to molecular synthesis of hydrocarbons in interstellar gas clouds and to the atmosphere of Titan. The latter is especially topical since the Titan atmosphere is to be probed by the NASA Huygens-Cassini spacecraft presently approaching the Saturnian system. Funding under NASA Grant No. NAG5-8951 is gratefully acknowledged.