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Trends in Ion-Electron Dissociative Recombination of Benzene Analogs DAVID OSBORNE, NIGEL ADAMS, University of Georgia — The Kepler Spacecraft successfully identified five new planets within the Habitable zones of stars in our region of the Milky Way. In our own planetary system the Cassini Spacecraft obtained mass spectra of the atmosphere of Saturn's moon Titan. To convert the mass spectra to molecular composition a great deal of kinetic rate data is required. These data are used to explain the processes by which small molecules form larger compounds within the Titan atmosphere. The models have indicated that larger ringed hydrocarbon species are present, like benzene. This makes the Titan atmosphere similar to the atmosphere of Early Earth and of interest to NASA. To help in the modeling, we have studied the kinetics of ion-electron recombination of various single ringed hydrocarbon analogs, like benzene. These data were obtained using a Variable Temperature Flowing Afterglow fitted with a Langmuir Probe to determine kinetic rates for ion-electron recombination. This technique was used for benzene analogs with varying degrees of nitrogen and methyl substitutions. From the data, it has been possible to determine trends which will reduce the amount of data needed in the modeling of the Titan atmosphere.

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