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Modeling Pyrolysis Production Formation Using Fourier Transform Ion Cyclotron Resonance

Publication: 1994 – 031

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MODELING OF PYROLYSIS PRODUCT FORMATION USING FOURIER TRANSFORM ION CYCLOTRON RESONANCE MASS SPECTROMETRY Michaela L. Rich (Curtiss D. Hanson), Department of Chemistry, University of Northern Iowa, Cedar Falls, IA 50614

The pyrolysis of styrene-butadiene rubber (SBR) produces large molecular weight aromatic and aliphatic hydrocarbons through secondary reactions in the gas phase. Fourier transform ion cyclotron resonance mass spectrometry (FT-ICR) was used to analyze the products produced by the gas phase reactions that occur during the pyrolysis of SBR tires. Conjugated diene systems were used on the FT-ICR as models for these reactions in order to better understand the process through which secondary pyrolysis products are formed. Deuterium labeling experiments were utilized to determine the mechanism for the model reactions. Relative rates of reaction and product distribution of the conjugated diene systems will be shown to be consistent with those from the SBR tire pyrolysis.

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