

# Recycling and Reuse Technology Transfer Center

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**Determination of charge-exchange thresholds of ionic  $C_3H_4^+$ :  
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**Determination of Charge-exchange Thresholds of Ionic  $C_3H_3^+$**  Layle K. Watkins  
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Cedar Falls, IA 50614

Recently, an ionic model for soot formation has been proposed based on a  $C_3H_3^+$  precursor. Two forms of  $C_3H_3^+$  are observed: *i*) The propargyl isomer, which reacts with dienes to produce a phenyl cation, and *ii*) an unreactive cyclopropenyl isomer ( $c-C_3H_3^+$ ). Because the unreactive cyclopropenyl isomer is the predominate ion formed during pyrolysis (>90%), the threshold barrier for endothermic charge exchange reactions of  $c-C_3H_3^+$  is critical to understanding the mechanism for pyrolysis product formation. Direct observation of the charge exchange reactions of  $c-C_3H_3^+$  with conjugated dienes has been accomplished using Fourier transform ion cyclotron resonance mass spectrometry (FT-ICR MS).

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**Selective Ion Isolation in MALDI-TOF Mass Spectrometry using a Pulsed EPG**  
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Time of flight mass spectrometry (*TOF-MS*) has become a valuable technique for the study of high mass biomolecules since the introduction of matrix assisted laser desorption ionization (*MALDI*) methods. The use of a pulsed electrostatic particle guide permits selective ion isolation in a linear TOF mass spectrometer. This increases both the sensitivity and dynamic range by selectively directing low abundance, high molecular weight ions to the detector. This improvement provides a means of detecting trace levels of high molecular weight compounds using a matrix assisted ionization technique.