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Method for Increasing Ion Charge in the Gas Phase

A novel method uses highly exothermic steps to increase the charge state of polymeric ions, dramatically improving the structural information obtained through mass spectrometry and enhancing ion utilization.

The ability to form ions from proteins, nucleic acids, and carbohydrates is becoming increasingly useful in mass spectrometry and tandem mass spectrometry to be applied to modern biological problems. Some techniques produce predominantly singly charged ions from polymers, but the extent of structural information that can be obtained via tandem mass spectrometry is a strong function of the charge state of the parent ion.

Purdue University researchers have found a way to increase the amount of structural information obtained via tandem mass spectrometry. This method provides a means for increasing the net charge of ions derived from polymeric species, such as peptides, proteins, and oligonucleotides, in the gas phase. This approach accomplishes in two highly exothermic steps with high cross-sections, which was previously accomplished via one or more highly endothermic steps with very small cross sections. The exothermic reaction compared with the endothermic reaction has the advantage of producing energy rather than using energy. Previous methods only allowed for singly charged ions to be formed, which limited the structural information obtained. Using tandem mass spectrometry and increasing the net charge could allow for a more thorough view of the ion structure in the gas phase, creating a better opportunity to utilize the ion.

Advantages:

-Increased ion utilization

-Increased scanning capabilities for tandem mass spectrometry

Potential Applications:

-Mass Spectrometry

Technology ID

63040

Category

Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

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-Chemical Analysis

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Intellectual Property:

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