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Differentially Pumped Dual Linear Quadrupole Ion Trap Mass Spectrometer

A new tandem ion-trap mass spectrometer simultaneously performs complex chemical analyses with high sensitivity, millisecond resolution, flexibility, and ease of use.

Mass spectrometers are used to detect the presence and structure of ions through measuring their mass-to-charge ratio. Ion trap mass spectrometers use an ion trap to accumulate and manipulate packets of ions in a confined space before they are detected. This method increases the sensitivity of the test because ions of lower concentration can be accumulated for better testing. Ion traps allow for further testing of the trapped ions by exposing them to collisions with gaseous atoms (collision-activated dissociation) or reactions with other molecules or ions (ion-molecule/ion-ion reactions). By analyzing the results of these exposures, it is possible to produce structural data about the ion that is not possible with mass spectrometry alone; however, both tests need to be performed separately to avoid interference with each other.

Researchers at Purdue University have developed a tandem ion-trap mass spectrometer that makes it possible to perform both tests simultaneously. Methods are implemented to allow for real-time screening of products while they are formed with millisecond resolution. The combination of both tests into one device provides a level of sensitivity, flexibility, and ease of use that is not available in current mass spectrometers.

Advantages:

-Two tests performed in tandem

-Flexible and easy to use

-Millisecond resolution

Potential Applications:

-Chemical Analysis

Technology ID

65968

Category

Materials Science & Nanotechnology/Materials Testing & Characterization Tools

Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

Authors

Hilkka Inkeri Kenttamaa

Benjamin Owen

Further information

Will Buchanan

wdbuchanan@prf.org

View online

TRL: 6

Intellectual Property:

Provisional-Patent, 2011-09-22, United States | NATL-Patent, 2012-09-24, Canada | PCT-Patent, 2012-09-24, WO | NATL-Patent, 2012-09-24, European Patent | EP-Patent, 2012-09-24, Germany | EP-Patent, 2012-09-24, France | EP-Patent, 2012-09-24, United Kingdom | NATL-Patent, 2014-03-19, United States | CON-Patent, 2015-09-15, United States | DIV-Patent, 2019-12-10, Europe

Keywords: Tandem ion-trap mass spectrometer, mass spectrometry, ion trap, mass-to-charge ratio, collision-activated dissociation, ion-molecule reactions, ion-ion reactions, chemical analysis, millisecond resolution, structural data, Chemistry and Chemical Analysis, Ion Trap, Mass Spectrometry