MULTIPLEX CHARGE DETECTION MASS SPECTROMETRY

Tech ID: 30152 / UC Case 2019-098-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,791,146	10/17/2023	2019-098

BRIEF DESCRIPTION

Native mass spectrometry (MS), in which electrospray ionization (ESI) is used to transfer large macromolecules and macromolecular complexes directly from solution into the gas phase, is a powerful tool in structural biology. However, charge-state distributions of individual components in mixtures of macromolecular complexes or synthetic polymers are often unresolved making it impossible to obtain mass information directly from an ESI mass spectrum. Other conventional methods can provide accurate masses of individual ions, but often at the expense of analysis time.

Weighing ions individually with charge detection mass spectrometry (CDMS) has the advantage that fast measurements are possible depending on the accuracy and sensitivity required. However, a limitation of trapping CDMS technology is the need to weigh single ions individually in order to eliminate potential interferences between the signals of multiple ions or ion-ion interactions that can potentially interfere with these measurements. UC researchers have created multiplex charge detection mass spectroscopy, particularly for high throughput single ion analysis of large molecules and measuring the masses of large molecules, macromolecular complexes and synthetic polymers that are too large or heterogeneous for conventional mass spectrometry measurements. The new multiplexing method makes it possible to measure the masses of many ions simultaneously.

SUGGESTED USES

» mass spectrometry measurements

ADVANTAGES

» the probability of ion-ion interference is significantly reduced

» over an order of magnitude gain in measurement speed over single ion analysis is demonstrated

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

▶ Full Signal Utilization In Charge Detection Mass Spectrometry

▶ Apodization Specific Peak Fitting In Charge Detection Mass Spectrometry

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INVENTORS

» Williams, Evan R.

OTHER INFORMATION

CATEGORIZED AS

» **Research Tools**

» Other

» **Sensors & Instrumentation**

» Analytical

» Scientific/Research

RELATED CASES

2019-098-0

- Sequential Pass Express Charge Detection Mass Analyzer
- Ambient infrared laser ablation mass spectrometry (AIRLAB-MS) with plume capture by continuous flow solvent probe
- Aerosol Ionization For Charge Detection Mass Spectrometry Ion Mobility Analysis

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