SEQUENTIAL PASS EXPRESS CHARGE DETECTION MASS ANALYZER

Tech ID: 32972 / UC Case 2023-040-0

PATENT STATUS

Country	Type	Number	Dated	Case
Patent Cooperation Treaty	Reference for National Filings	WO 2024/118604	06/06/2024	2023-040

Patent Pending

BRIEF DESCRIPTION

Charge detection mass spectrometry (CDMS) effectively bridges the gap in mass measurement technologies and is well suited to the analysis of aerosol-borne viruses and even bacteria such as tuberculosis. CDMS can provide mass measuring accuracies for ions with masses above 500 kDa that are comparable to more expensive conventional instruments and, most importantly, this technology can be applied to ions that are too large (10+ MDa) or heterogeneous to measure using conventional MS. Single pass CDMS instruments have been used to measure masses of large polymers, nanodroplets, dust, and bacterial spores. Mass measurements of MDa-sized PEG molecules and polystyrene nanoparticles (50–110 nm diameter) using an array of 4 detection tubes positioned between the trapping electrodes of an electrostatic ion trap (EIT) have been previously reported. However, no commercial CDMS instrumentation yet exists that can measure masses in the range of 10's to 1000's of MDa.

UC Berkeley researchers have developed a charge detection mass analyzer which is designed to enable mass measurements of individual ions at rates greater than 10,000 ions per second, ~1000x faster than current state-of-the-art charge detection mass spectrometry instrumentation and other methods that measure molecules >1 MDa in size.

SUGGESTED USES

» a sequential pass express charge (e) detection (SPEeD) mass analyzer designed for highly sensitive, rapid mass measurements of high mass (>1 MDa) analytes.

ADVANTAGES

» SPEeD analyzer enables high throughput and sensitivity because ions merely need to pass through the series of detectors a single time for a mass measurement to made.

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

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OTHER INFORMATION

CATEGORIZED AS

» **Sensors & Instrumentation**

» Physical Measurement

» Scientific/Research

RELATED CASES

2023-040-0

- High Performance Charge Detection Mass Spectrometry Without Ultra-High Vacuum
- Multiplex Charge Detection Mass Spectrometry
- 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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