PURDUE INNOVATES | Office of Technology Commercialization

Coated Capillary for Sample Pretreatment

A novel extraction capillary combines sample preparation, pretreatment, and ionization for faster, high-control analysis of small sample amounts via mass spectrometry.

Mass spectrometry is a powerful tool for the analysis of complex mixtures, which provides specific molecular information based on the molecular weights and chemical structures of the target compounds. Current mass spectrometry techniques require the sample to undergo a time-consuming pretreatment and extraction before it can be analyzed with a mass spectrometer. Once the sample has been treated and extracted it must be ionized, allowing for the manipulation and identification of the sample by the mass spectrometer. Each of these steps requires a significant amount of time and any mistakes could invalidate the entire test.

Researchers at Purdue University have developed a new approach for liquid-solid phase-liquid extractions and provides systems and methods that allow for the combination of sample preparation and pretreatment with the ionization process. Using a thin capillary tube and coating the inner surface with layers of adsorbents, it is possible to maintain full control of the extraction process. The thin capillary tube allows for the quantitative analysis of small sample amounts. In addition, the extraction capillary can serve as an ionization probe, allowing for the extraction, treatment, and analysis by mass spectrometry without separate sample preparation or pretreatment of a target analyte in a sample.

Advantages:

-Small sample size

-Combines sample preparation and pretreatment with the ionization process

-Better ionization of samples

Potential Applications:

-Mass spectrometry

Technology ID

2016-OUYA-67584

Category

Materials Science & Nanotechnology/Nanomaterial Characterization & Imaging Tools

Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

Authors

Zheng Ouyang

Wenpeng Zhang

Further information

Patrick Finnerty

pwfinnerty@prf.org

View online

-Chemical analysis

TRL: 4

Intellectual Property:

Provisional-Patent, 2016-06-03, United States | PCT-Patent, 2017-06-02, WO | NATL-Patent, 2018-11-16, United States | NATL-Patent, 2018-11-29, Canada | NATL-Patent, 2018-11-29, Japan | NATL-Patent, 2018-12-13, European Patent | NATL-Patent, 2019-01-21, China | DIV-Patent, 2019-01-21, China | CON-Patent, 2021-06-14, United States | DIV-Patent, 2023-07-18, Japan | DIV-Patent, N/A, Japan | EP-Patent, N/A, France | EP-Patent, N/A, Germany | EP-Patent, N/A, United Kingdom

Keywords: Mass spectrometry, chemical analysis, sample preparation, ionization process, liquid-solid phase-liquid extraction, thin capillary tube, extraction capillary, small sample size, pretreatment, target analyte