

Paper Spray Ionization Without Applied Voltage

Track Code: 2015-COOK-67074

Categories:

- Chemistry and Chemical Analysis

Keywords:

- Chemistry and Chemical Analysis
- Mass Spectrometry
- Paper Spray Ionization

Mass spectrometry (MS) is a powerful analytical technique because of its high sensitivity, selectivity, and speed. Recent progress in MS has depended heavily on advances in methods of ion formation. Creation of stable molecular ions of complex molecules with minimum internal energy has been a primary goal of such experiments. The most widely used methods to achieve this use a high voltage source coupled to the probe to achieve ionization in an ambient environment. The application of high voltage can cause unwanted fragmentation of a target analyte during the ionization process.

Researchers at Purdue University discovered a system configuration that enables paper spray to generate ions for analysis without any voltage source (0 voltage paper spray). Solvent is supplied to a porous material, interacts with a sample within the porous material, and flows to the tip of the porous material. Given a short distance between the tip of the porous material and the inlet of the mass spectrometer, the solvent (now containing one or more analytes of the sample) flows from the porous material into the inlet of the mass spectrometer. Random charging during the breakup of droplets occurs, generating sample ions, which are analyzed within the mass spectrometer. In that manner, systems of the invention generate and analyze ions of a sample without the application of voltage to the porous material.

Advantages:

- Paper spray ionization without applied voltage
- Favorable for certain applications, for example those involving live subjects

Potential Applications:

- Mass spectrometry
- Chemical analysis

People:

- Cooks, Robert Graham (Project leader)
- Bag, Soumabha

- Li, Yafeng
- Pradeep, Thalappil
- Sarkar, Depanjan
- Wleklinski, Michael Stanley

Intellectual Property:

Application Date: September 7, 2017

Type: CON-Patent

Country of Filing: United States

Patent Number: 10,256,085

Issue Date: April 9, 2019

Application Date: December 3, 2015

Type: Utility Patent

Country of Filing: United States

Patent Number: 9,786,478

Issue Date: October 10, 2017

Application Date: February 20, 2019

Type: CON-Patent

Country of Filing: United States

Patent Number: (None)

Issue Date: (None)

Application Date: January 26, 2015

Type: Provisional-Patent

Country of Filing: United States

Patent Number: (None)

Issue Date: (None)

Application Date: December 5, 2014

Type: Provisional-Patent

Country of Filing: United States

Patent Number: (None)

Issue Date: (None)

Contact OTC:

Purdue Office of Technology Commercialization
1801 Newman Road
West Lafayette, IN 47906

Phone: (765) 588-3475

Fax: (765) 463-3486

Email: otcip@prf.org