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Technology Transfer Office

Ionic Liquid Mediated Sol-Gel Sorbents

Researchers at the University of South Florida have developed ionic liquid-mediated sol-gel sorbents for the effective use in analytical micro-extraction.

It is a fairly common research practice to utilize a column to extract a desired analyte from a mixture. With the current trend of miniaturization in analytical instrumentation, micro-extraction techniques are gaining popularity. Analytes such as ionic liquid (IL) mediated sol-gel organic-inorganic materials present enormous potential for effective use in chemical analysis. However, hydrophilic polar analytes are notoriously difficult to extract and preconcentrate from aqueous matrices. Hence, there is a need for a easier and more efficient extraction method for these analytes.

USF researchers have developed a method which provides advanced sol-gel organic-inorganic hybrid materials for capillary micro-extraction. These materials can be fabricated from phosphonium, pyridinium and imidazolium. Preliminary results demonstrate that IL-mediated sol-gel coatings prepared with silanol-terminated polymers provided up to 28 times higher extractions compared to analogous sol-gel coatings prepared without any IL in the sol solution. This technology has therefore revealed that IL-generated porous morphology alone is not enough to provide effective extraction media. Further, results also showed that a careful choice of organic polymer and a precursor with close sol-gel reactivity must be made to ensure effective chemical bonding of the organic polymer to the created sol-gel material. Thus, this invention provides a better insight into the use of ionic liquid mediated sol-gel sorbents for improved variety and efficiency of extraction.

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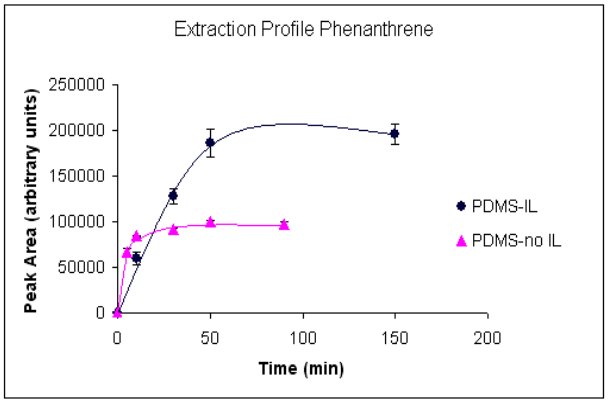
ADVANTAGES:

- **Enrichment of trace analytes from a diverse range of matrices**
- **Utilizes different types of ionic liquids**
- **Greater extraction efficiency**
- **Provides insight for improved variety and extraction efficiency**

Highly Efficient IL-Mediated Organic-Inorganic Hybrid Extraction Media



The PDMS-IL Coating had a Higher Extraction Capacity than PDMS-no IL

University of South Florida | Technology Transfer Office
813.974.0994 (office) | 813.974.8490 (fax)
patents@research.usf.edu
http://www.usf.edu/research-innovation/pl/