

Synthesis of inorganic-organic hybrid materials using molecularly imprinting polymerization technique and their application as sorbents in solid phase extraction cartridges

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Solid phase extraction (SPE) is one of the most popular sample preparation techniques being employed in different fields of separation science. Its application in the purification of bioproducts is quite well known and, for this purpose, different types of sorbents (C_{18} etc.) are utilized in SPE cartridges to extract the analyte from the sample matrix. However, these sorbents may cause the coextraction of interfering substances, which calls for further purification. To overcome these drawbacks, new techniques like Molecularly Imprinting Polymerization have been developed and applied. The molecularly imprinting polymerization technique was utilized for the synthesis of molecularly imprinted hybrid polymer (HMIP) to extract caffeine from coffee sample. A HMIP for caffeine was prepared using vinyl acetate and 3-(trimethoxysilyl)propyl methacrylate as functional monomers and tetraethylorthosilicate as a precursor for the sol gel process. The whole synthesis took 96 hours at 50 °C. The morphology of the hybrid polymers was studied through scanning electron microscopy. The performance of HMIP was evaluated by comparing it with a non-imprinted hybrid polymer (HNIP), synthesized without caffeine. The ability of polymers to extract caffeine was tested by applying SPE using HMIP and HNIP as sorbents and later analyzing the eluates by high performance liquid chromatography with ultraviolet detection. Eluates from HMIP showed a 25 times higher concentration of caffeine as compared to HNIP's eluates. This indicates the affinity of HMIP for caffeine and therefore serves as a useful mean to extract this analyte from different sample sources.

Biography

Suryyia Manzoor has completed her master in Analytical Chemistry from University of Pakistan and was appointed as a lecturer in Chemistry. She is currently a Ph.D student in Analytical Chemistry at UNICAMP, sponsored by TWAS (Third World Academy of Sciences). Regina Buffon has completed her Ph.D from Université Claude Bernard - Lyon 1 and has published more than 35 papers. Adriana Vitorino Rossi has completed her Ph.D from UNICAMP where she has been working as a Professor of the Analytical Chemistry Department since 1996.

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