

New dispersive solid phase microextraction sorbent based on sol-gel hybrid material for non-steroidal anti-inflammatory drugs analysis in water

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Dispersive solid phase microextraction (DSPME) is a simple and environmental friendly sample preparation technique. In DSPME, the sorbent is used for trapping the analyte/s out of the solution and then the analyte/s is to a smaller volume of a second desorption solvent. In this study, a new DSPME sorbent material based on a hybrid organic–inorganic methyltrimethoxysilane–cyanopropyltriethoxysilane (MTMOS–CNPrTEOS) was synthesized by using two steps sol–gel method. The new DSPME hybrid sorbent was used in determination of three selected NSAIDs namely, diclofenac sodium, ketoprofen and mefenamic acid in water samples prior to high performance liquid chromatography with ultraviolet (HPLC–UV) detection. Under the optimized conditions, the method demonstrated good linearity ($0.2\text{--}500\ \mu\text{g L}^{-1}$) with excellent coefficient of determination ($r^2 > 0.9991$), good RSDs ($<2.4\%$, $n = 3$), good limit of detection ($0.03\text{--}0.12\ \mu\text{g L}^{-1}$) and excellent recoveries ($93.5\text{--}97.6\%$). The DSPME method using the new sol-gel hybrid MTMOS–CNPrTEOS material combined with HPLC–UV proved to be a simple, cost efficient and requires minimal amount of organic solvent that support green chemistry concepts.

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