Extraction of phenol using poly(styrene-co-divinylbenzene) monolithic bead
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Abstract: In this work, poly(styrene-co-divinylbenzene) or PS-DVB monolithic adsorbent was synthesized as a bead shape to extract phenol from water matrix. Quantitative level of the target analyte will be performed by gas chromatography with flame ionization detection (GC-FID). In the synthesis of this adsorbent, styrene and divinylbenzene were used as monomer and dibenzoyl peroxide was used as an initiator. In order to improve porosity, decanol and tetrahydrofuran were added into the polymerization step. The morphology of synthesized material showed an interconnected spherical shape of monolith structure of about 2 µm diameter. Owing to internal particles of the material that are uniform and thoroughly interconnected within the macropore network, the selectivity and permeability for extraction of phenol from 50 mL of water sample was improved. The results showed good recovery about 89.59% and linear relationship with $R^2 \geq 0.99$. Limit of detection for this method was 13.26 µg/L.

Keywords: Monolithic adsorbent; Poly(styrene-co-divinylbenzene); Phenol; Gas chromatography with flame ionization detection