

عنوان مقاله:

Application Of Magnetic Metal-Organic Framework Nano Composite For Solid Phase Extraction Of Methylene Blue From Aqueous Solutions

محل انتشار:

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تعداد صفحات اصل مقاله: 2

نویسندگان:

M Saghanejhad Tehrani - Department of Chemistry, Iran University Of Science And Technology, Tehran, ۱۳۱۱۴-۱۶۸۴۶, IRAN

R Zare-Dorabei - Department of Chemistry, Iran University Of Science And Technology Tehran, ۱۳۱۱۴-۱۶۸۴۶, IRAN

خلاصه مقاله:

In this study the adsorption behaviour of Fe₃O₄ coated with TMU-3 MOF (Metal Organic Framework) based on zinc-benzenedicarboxylate as a synthetic nano adsorbent (Fe₃O₄@TMU-3) was investigated in order to separate Methylene Blue (a cationic dye) from water solutions. Various experiments have been carried out in batch adsorption technique by means of experimental design method to study the effects of the main parameters such as contact time, initial dye concentration, pH, dosage of sorbent and dye solution temperature on the solid phase extraction process. The results showed that the adsorption attained to equilibrium in 60 min at room temperature and the monolayer sorption capacity obtained was 49.24 mg/g for Fe₃O₄@TMU-3. The used Fe₃O₄@TMU-3 could be regenerated by washing with a dilute concentration of NaCl solution. The adsorption of methylene blue was also driven by electrostatic attraction and the interaction between the Lewis base -N(CH₃)₂ in methylene blue and the water molecule coordinated metal sites of TMU-3. Based on this study, MOFs can be suggested as potential adsorbents to remove harmful materials in the liquid phase.

کلمات کلیدی:

Fe₃O₄, Metal Organic Framework, Adsorption, Methylene Blue, Experimental Design Method

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