عنوان مقاله:

Studying the Adsorption Process of Riboflavin on Silver-Deposited Fe۳O۴ Nanoparticles

محل انتشار:

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خلاصه مقاله:

The adsorption characteristics of riboflavin onto silver-deposited iron oxide magnetic nanoparticles (Ag/Fe۳O۴) have been described. Characterization of the synthesized Ag/Fe۳O۴ nanoparticles was achieved by FTIR spectra, TEM image and XRD pattern. The influence of several experimental parameters such as nanoparticles dosage, pH of the sample solution, different orientations of the riboflavin molecules toward Ag/Fe۳O۴ surface, riboflavin concentration, contact time of the reagents, temperature, ionic strength and presence of halide anions were studied. Experimental data indicated that Ag/Fe۳O۴ nanoparticles adsorb more than ۹۰% of riboflavin under the optimum experimental conditions of the adsorbent dosage of ۴.۰ mg, a pH of ۶.۰, and a contact time of ۲.۰ min, when an initial riboflavin concentration of ۰.۰۲ mM is used. The results revealed that the presence of halide anions lower the adsorption of riboflavin on the surface of nanoparticles due to dissolution of the silver layer of the nanoparticles. It was found that the adsorption isotherm is best fitted to Dubinin-Radushkevich and Freundlich models and kinetic model followed a pseudo-second-order adsorption rate.

کلمات کلیدی:

Riboflavin, Silver-deposited Fe۳O۴ nanoparticles, Adsorption, UV-Vis spectroscopy, Magnetic nanoparticles