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عنوان مقاله:

Investigating Methylene Blue Dye Adsorption Isotherms Using Silver Nano Particles Provided by Aqueous Extract of Tragopogon Buphthalmoides

محل انتشار:

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خلاصه مقاله:

Dyes pose significant environmental threat due to their wide application in industries. Since dyes are not properly refined through common processes and are usually accompanied by dangerous by-products, adsorption by metal nanoparticles provided by green method is among appropriate substitution methods because of high efficiency, cost-effectiveness and lack of environmental risks. The goal of this study was to investigate the performance of synthesized silver nanoparticles by the extract of Tragopogon buphthalmoides in optimum and characterized condition by UV-Vis, XRD, FESEM, TEM and FTIR techniques as a nano adsorbent in removal of Methylene Blue (MB) dye from aqueous solution. After preparation of the aforementioned nano adsorbent, relevant pHpzc was determined and MB was adsorbed with nano adsorbent in different concentrations in optimum pH and different temperatures. Langmuir, Freundlich and Temkin isotherm models were used to investigate obtained experimental data. Research has shown that MB adsorption process from Langmuir isotherm follows R2=0.9999 and increases with increasing temperature and maximum adsorption capacity (qmax) of 13-nanometer circular silver nano adsorbent has been 48.698 mg/g. Results prove that Tragopogon b. is able to reduce metal ions to metal nanoparticles and stabilize them through green method due to antioxidants properties and nanoparticles can be employed as the effective adsorbent to eliminate MB from water and industrial wastewaters.

کلمات کلیدی:

Silver nanoparticles, Tragopogon buphthalmoides, Biosynthesis, Methylene blue, Adsorption Isotherm

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