

عنوان مقاله:

LaMnO₃ High-speed adsorbent to remove methyl orange from aqueous solutions

محل انتشار:

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خلاصه مقاله:

Dyes, organic compounds with complex structure, often toxic, carcinogenic, mutagenic, biodegradable and are one of the most common pollutants in the textile and dye industry [1-2]. The purpose of this study was to evaluate the efficiency of methyl orange dye removal from aqueous solutions using nanoparticles of Lanthanum manganite. In this research, the synthesis of Lanthanum manganite nanoparticles was carried out using hydrothermal method [3] and used as adsorbent to remove methyl orange dye. The adsorbent characteristics were made by analyzing XRD, FTIR and pH zero point (pH_{pzc}). In the FTIR analysis, the main adsorbent structure before and after absorption has not changed. The obtained XRD pattern was prepared to study the crystalline structure of the prepared composition. Also, the effects of pH parameters, absorbent dose, initial concentration of dye, contact time were performed. The XRD image shows the presence of nanoparticles of Lanthanum manganite with an approximate size of 52 nm. The results showed that by increasing the contact time for 20 minutes, the amount of adsorbent was 0.0025 g, the initial concentration of 10 mg/L, pH 1.5 and the room temperature increased the removal efficiency of the dye. Studies have shown that experimental data are more consistent with Langmuir isotherm and pseudo -second order kinetic model. Based on the results of this study, it seems that Lanthanum manganite can be used as an appropriate, inexpensive and effective adsorbent for methyl orange removal from aqueous solutions.

کلمات کلیدی:

Lanthanum manganite, Methyl orange dye, Adsorption Process

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