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Application of response surface methodology for optimizing adsorption performance of magnetic graphene oxide nanocomposites for removal of methadone

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Magnetic Graphene Oxide (MGO) nanocomposites have been synthesized by the co-precipitation route. The surface structure of MGO nanocomposites was analyzed by XRD, TEM, SEM, VSM and nitrogen adsorption-desorption instrumental techniques. Response surface methodology was applied to optimize the removal of methadone by MGO nanocomposites in an aqueous solution. Experiments were conducted based on a Box-Behnken Design (BBD). The influence of three parameters on the removal of methadone was examined using a response surface methodological approach. The significance of the independent variables and their interactions were tested by the Analysis of Variance (ANOVA). The optimum pH, adsorbent dose and temperature were found to be 6.2, 0.0098 g and 295.7 K, respectively. Under these conditions, removal efficiency of methadone was found to be 87.20 mg/g.

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