Efficiency of magnetic chitosan supported on graphene for removal of perchlorate ions from wastewater

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ABSTRACT

In this study, we used a synthesized cross-linked magnetic chitosan with graphene oxide beads to study the removal of perchlorate from wastewater. The prepared complex was characterized using transmission electron microscopy (TEM), Fourier Transformation Infrared spectroscopy (FT-IR), vibrating sample magnetometry (VSM) and Thermal gravimetric analysis (TGA). Several parameters were studied including the effect of pH, contact time and the co-existing anions. The study showed that the adsorption could be studied in a wide range of pH. The study showed that the adsorption follows a pseudo-second-order model and Langmuir adsorption isotherm. The enthalpy and negative Gibbs standard free energy showed that the adsorption
process was exothermic and spontaneous. The perchlorate adsorbent can be regenerated well by 0.1% NaCl solution.

KEYWORDS: Magnetic chitosan, graphene, adsorption, kinetics, isotherm, perchlorate