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INVESTIGATION OF AMMONIUM ION ADSORPTION ONTO REGENERATED SPENT BLEACHING EARTH: PARAMETERS AND EQUILIBRIUM STUDY

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Abstract

The release of nitrogen compounds into the environment is a major concern worldwide. Different studies showed that recycled materials have a high removal capacity for pollutants. Bentonite and its major clay minerals, smectites clays are common bleaching agents used for oil refinery bleaching and known as bleaching earth (BE). In this study regeneration of spent bleaching earth (SBE) acquired from the vegetable oil industry was surveyed via different methods and the regenerated spent bleaching earth (RSBE) was used for ammonium ion removal from aqueous solution in batch experiment. The effects of pH, contact time and initial ammonium ion concentration were determined and adsorption isotherms were also obtained. Our study shows that the adsorption process follows the Freundlich adsorption isotherm and maximum removal efficiency of ammonium ion was 81% obtained at pH=6 and 8g/L RSBE. The ammonium ion adsorption for RSBE was best fitted with pseudo-second order model. The survey of adsorbent selectivity showed high selectivity toward ammonium ion.

Key words: adsorption, ammonium ion, bleaching earth, regeneration

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