

INVESTIGATION OF KINETICS OF ADSORPTION OF METHYLENE BLUE ON ACTIVATED CARBON

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Abstract

This paper investigated the adsorption kinetics of methylene blue (MB) on activated carbon. Tests of the adsorbent (granulometric composition and FT-IR analysis) showed that the adsorbent has a wide distribution of particles (5-250 μm) and that the most frequent vibrations are caused by N=C=N stretching, C=C=C stretching, metal-oxygen vibrations (e.g. Fe-O) and heteroatomic vibrations (C-Cl or C-Br). Increasing the dose of adsorbent and decreasing the initial concentration of methylene blue increases the efficiency of adsorption, while the most intensive adsorption takes up to 10 min. The adsorption process is pseudo-second-order, which indicates that adsorption occurs due to chemical interactions between adsorbate and adsorbent. The results indicate that the use of activated carbon achieves a high level of MB removal, especially under optimized conditions.

Keywords: Activated carbon; Methylene blue; Adsorption kinetics; Pseudo-second order; FT-IR analysis; Granulometric analysis