KINETIC AND EQUILIBRIUM STUDIES ON THE ADSORPTION OF REMAZOL ULTRA RED RGB DYE FROM AQUEOUS SOLUTIONS USING PALM LEAVES

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Abstract - Water pollution by chemical pollutants has become a primary public concern in recent years. Among these pollutants, the major compound that caused water pollution is the increasing use of dyes in textile, plastics, pharmaceutical, leather, cosmetics, paper and food industries in order to colour the products. Therefore, it is of great importance for researchers to build up effective technologies for dye removal processes. Among various available methods for the removal of dye, adsorption is one of the preferred techniques because of its cheapness, eco-friendliness, effectiveness, easy application and the availability of a wide range of adsorbents [1,2]. In recent years, research on the usage of economical adsorbents alternative to commercially available activated carbon has increased [3,4]. Hence, palm leaves as natural bioadsorbent were used for the adsorption of Remazol Ultra Red RGB. The adsorption isotherm and adsorption kinetics have been evaluated to establish the mechanisms of adsorption [5]. Therefore, in the present study, for the investigation of the feasibility of the adsorption process, Freundlich, Langmuir, Temkin and Dubinin Radushkevich models were applied as isotherm models. Besides, for the adsorption kinetic studies; Pseudo first-order kinetic model, Pseudo second-order kinetic model, Intra-particle diffusion kinetic model, Elovich kinetic model and Boyd Plot kinetic model were applied. In addition, the reusability of the palm leaves was also studied and it was seen that the leaves could be reused highly effectively as adsorbent.

Keywords - Adsorption, Palm Leaves, Remazol Ultra Red RGB, Isotherm, Kinetic.

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