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Kinetic and Thermodynamic Study the Adsorption of Brilliant blue Dye on Peel of Plant.

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Abstract: In the present work, it was used low–cost adsorbent (almond peel and sunflower seed shell) which activated by H_2SO_4 and HCl to removal Brilliant blue dye from aqueous solution. Adsorption studies were carried out to find the effect of different parameters such as: (contact time, adsorbent doses, pH, and temperature effect). The results in this experiment showed that the adsorption of brilliant blue dye at initial concentration (30 ppm) was rapid in the first of contact time until reached to the equilibrium time at (40, 30)min for almond peel activated by H_2SO_4 and HCl respectively and (35, 40)min for sunflower seed shell activated by H_2SO_4 and HCl respectively. The percentage removal of brilliant blue from aqueous solution was about 95% with almond peel activated by $H_2SO_4$and 97% with almond peel activated by HCl. But the percentage removal for dye with sunflower seed shell activated by H_2SO_4 and HCl about 97%. This percent removal of Brilliant blue was at the equilibrium time for all the adsorbent also at the optimum doses which were 0.8g for almond peel activated by H_2SO_4 and HCl but 0.9g for sunflower seed shell activated by H_2SO_4 and 0.6g for sunflower seed shell activated by HCl. The maximum value to percent removal of Brilliant blue from aqueous solution was in the acidic pH. The adsorption kinetics was analyzed by using the pseudo – first and second order models and the results showed that the adsorption kinetics were more accurately described by a pseudo – second order model. Thermodynamic parameters such as the change of free energy, enthalpy and entropy were also evaluated. The results indicated that the adsorption of the Brilliant blue dye onto the (almond peel activated with H_2SO_4) is endothermic, decrease disorder, spontaneity of the adsorption process. But the adsorption of the Brilliant blue dye onto the (almond peel activated with HCl) was an endothermic, decrease disorder and no spontaneity of the adsorption process. The adsorption of the Brilliant blue dye onto (sunflower seed shell activated with H_2SO_4 and HCl) were an exothermic process, increase disorder and spontaneity of the two adsorption process.

Keywords: Adsorption, Brilliant blue, almond peel, sunflower seed shell.

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