ABSTRACT

In the present study, locally available and inexpensive materials were used to produce the soot (AS_1) surface. The AS_1 surface was prepared by several steps in this present study, AS_1 was extracted from a paraffin candle by collecting it in a clean dry beaker. The AS_1 was treated with Hummer's solution to obtain activated soot (AS_2). For remove of three dyes (Disperse Red Crystal Violet and Alizarine Red S) for aqueous solution. The physical characterization of these prepared materials (AS_1, AS_2) by using different techniques (Fourier Transform InfraRed (FTIR), X-ray Diffraction (XRD), Scanning Electron Microscope (SEM) and surface area analysis (BET)). Study optimum condition of the effect of adsorption parameter (pH, temperature, contact time and adsorbent weight) The results showed that the adsorption process was S-type rendering to the Giles classification and the equilibrium time was 15 min for the three dyes onto AS_1 and AS_2. Thermodynamic analysis showed that the adsorption of three dyes onto AS_1 and AS_2 was exothermic and spontaneous (physical adsorption) obtained from ΔG^o and ΔH^o, while negative values for ΔS^o indicated reduced randomness. The pH values showed that the optimum pH for the absorbance was pH 4 for the (AR and DR) dyes and pH 10 for the CV dye. Correspondingly, the adsorption information showed that the percentage of removal for three dyes increase with the increase of adsorbent weights of two surfaces. The analysis of adsorption kinetics models was shown that the adsorption of three dyes on to soot and activated soot appley the pseudo-second order of kinetic models.