**Abstract**

In this work, glucose grafted polyaniline/graphite composite has been used as an efficientadsorbent for the removal of methylene blue (MB) and reactive red M5B (RR-M5B) from aqueoussolution. The adsorption performance of the polymer was investigated by varying the parameterssuch as pH (2-11), agitation time (100 min), adsorbent dose (0.02 g – 0.12 g) and temperature (30°C-50 °C) at different initial concentration of dyes (10 mg/L-100 mg/L). The pseudo-second orderequation and the Langmuir model exhibited good correlation with the adsorption kinetic andisotherm data for both the dyes, respectively. The thermodynamic studies (ΔG < 0, ΔH < 0, ΔS <0) implied that the adsorption of dyes were endothermic and spontaneous in nature. The maximumremoval efficiency of MB was 93.22% and 84.21 % for RRM5B under optimum conditions withadsorption equilibrium time of 60 min. A possible adsorption mechanism has been proposed,where H-bonding and electrostatic interactions dominated the adsorption of the organic dyes.