**Abstract**

  Activated carbon of Prosopis juliflora Bark (PJBAC) is prepared using muffle furnace and employed for the removal of Direct BrownMR (DBMR) dye from aqueous solutions. Surface morphological studies carried out for unloaded and loaded carbons; indicate the surfacechanges in the porous nature of the dye loaded PJBAC. Batch equilibration experiments pertaining to the study of operating factors viz.,varying initial dye concentrations, preset time intervals and different doses of PJBAC, variable pH and temperature environments are verifiedto assess the sorptive nature of PJBAC. Optimized conditions have been setup as 400 mg/L initial concentration; 60 min contact time; 100 mgdosage, pH 2 and 300C temperature for a maximum of 90.2% dye removal with a sorption capacity of 180.4 mg/g. The isothermal plots forLangmuir, Freundlich and Tempkin equations are tested, wherein the best fit of linearity is observed for both Langmuir and Freundlichadsorption isotherms, suggesting monolayer/multilayer sorption. Thermodynamic parameters are calculated to study the nature of sorption, observed as endothermic, irreversible and spontaneous for DBMR-PJBAC system. Kinetic studies reveal the applicability of second order kinetic model.