ABSTRACT

Response surface methodology (RSM) was employed to investigate the effects of different process variables on the biodecolorization of synthetic dye solution containing Congo red with Curvularia sp. RSM, involving Box–Behnken design matrix for three most important influencing process variables; initial dye concentration (20–100 mg l$^{-1}$), pH (2–8) and temperature (25–40°C) were successfully carried out for the study and optimization of decolorization process. According to the mathematical models developed by the proposed system, for each process variables showed the effect of each factor and their interactions on color removal. The optimum concentrations of dye, pH, and temperature were found to be 60 mg l$^{-1}$, 5, and 32.5°C, respectively, for complete decolorization of Congo red (100%). Predicted values were validated with experimental data, which indicated suitability of the employed model and the success of RSM. High-performance liquid chromatography and Fourier transform infrared analysis confirmed degradation of Congo red.

Keywords: Color removal; Curvularia; Concentration; Congo red; Fungi; RSM