



Decolorization of Sunzol Black DN conc. in aqueous solution by Fenton oxidation process: effect of system parameters and kinetic study

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ABSTRACT

The decolorization of Sunzol Black DN conc. (SBDN) in aqueous solution by Fenton oxidation process was studied. The effects of different reaction parameters such as initial hydrogen peroxide concentration ($[H_2O_2]_0$), initial Fe^{2+} concentration ($[Fe^{2+}]_0$), pH, temperature and the initial SBDN concentration ($[SBDN]_0$) on the decolorization of the SBDN dye have been investigated. The optimal reaction conditions were experimentally determined and it was found to be $[H_2O_2]_0 = 4$ mM, $[Fe^{2+}]_0 = 0.05$ mM, pH = 3.5 and $[SBDN]_0 = 100$ mg/l at temperature 30°C. Under optimal condition, 94.5% decolorization efficiency of dye in aqueous solution was achieved within 90 min of reaction. The decolorization kinetics of SBDN by Fenton oxidation process followed the second-order reaction kinetics, and the apparent activation energy, was found to be 38.582 kJ/mol.

Keywords: Fenton oxidation process; Sunzol Black DN conc.; Hydroxyl radical; Kinetic

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