

Treatment of reactive dye solutions by physicochemical combined process

A.Z. Bouyakoub^a, S. Kacha^{a*}, B. Lartiges^b, S. Bellebia^a, Z. Derriche^c

^aLaboratoire des Matériaux et Systèmes Réactifs, Université Djillali Liabes, Sidi Bel Abbès, BP 89, 22000 Sidi Bel Abbès, Algeria
Tel. +213 (48) 56 75 77; Fax +213 (48) 54 43 44; email: smail_k@yahoo.fr

^bLaboratoire Environnement et Minéralurgie, 15 Avenue du Charmois - BP 40, 54501 Vandoeuvre-Lès-Nancy Cedex, France

^cLaboratoire de physico-chimie des Matériaux, Université des Sciences et de la Technologie d'Oran, BP 1505, 31000 Oran, Algeria

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ABSTRACT

Color and turbidity removal from solutions of two reactive dyes: brilliant blue Levafix EBRA and gold yellow Levafix EG were studied. Coagulation–flocculation by polyaluminium hydroxide (PAH) and bentonite, followed by adsorption on powdered activated carbon (PAC) techniques were used. Optimal parameters of coagulation–flocculation (jar tests) and adsorption (temperature, pH, contact time and PAC concentration) were determined under optimal conditions for maximal dye elimination. 99.89% and 99.02% of color removal were obtained from 100 mg/L of dye solutions, respectively. Bentonite and aluminum used concentrations were 0.50 g/L and 27.6 mg/L (blue EBRA); also 0.37 g/L and 15.0 mg/L (yellow EG), coupled with 1.0 g/L of PAC for each dye. At suitable conditions this combined process was able to efficiently remove color from solutions containing reactive dyes and produce easily settle-able sludge, using moderate amounts of reagents, and thereby the low-cost of treatment.

Keywords: Reactive dye solutions; Coagulation; Flocculation; Bentonite; PAC; Adsorption

* Corresponding author.