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Removal of Reactive dye from aqueous Solutions by filamintos algae

Faezeh Mohammadi[1, 2]Shirin Afshin[1, 2] ,Yousef Rashtbari[1, 2], Roya Askari[1, 2], Amir Moharrami[1, 2], Mehdi Vosoughi[2]*

[1] Students Research Committee, Faculty of Health, Ardabil University of Medical Sciences, Ardabil, Iran;, feryalmohammadi735@gmail.com, roya.askary1375@gmail.com, amirmoharrami77@gmail.com, u3frashtbari@gmail.com, shirinafshin1990@gmail.com
[2] Department of Environmental Health Engineering, School of Health, Ardabil University of Medical Sciences, Ardabil, Iran

Corresponding author: Mehdi Vosoughi; mvn-20@yahoo.com

Abstract

Aim of study: Colors are complex structural materials, which enter into the environment due to discharging of textiles effluent from dyeing and printing process. Reactive Blue 52 dye is used widely in the textile industry. Therefore, we investigated the efficiency of the filamentous alga as natural adsorbent in the removal of Reactive Blue 52 dye from textile wastewater.

Methodology: This experimental study was performed in laboratory scale. In this study, the effect of adsorbent dose, contact time, pH and different dye concentrations on efficiency of adsorption process were studied. Finally, data fitting rate into Langmuir and Freundlich isotherms and pseudo-first-order and pseudo-second-order adsorption kinetics were determined to analysis the data of liner regression and R2.

Results: According to the obtained results, increasing of adsorbent dose to 16 g/100 ml in concentrations of 50 mg/l RB52 lead to an increase in the removal efficiency to 58.04%. Adsorption capacity by increasing pH from 3 to 11 for concentrations of 10 and 25 mg/l decreased from 31.2 to 8.41 %, respectively. The results showed that with the increase of contact time, removal efficiency increased and with increasing of initial dye concentration, the removal efficiency decreased.

Conclusion: The data fitted well into Langmuir isotherm. As well as, pseudo-second-order and kinetic model fitted well with the experimental data. The results showed that filamentous algae is a suitable natural absorbent for color removal.