

## Biosorption of Titan yellow and Methyl red by *Sargassum glaucescens*: kinetic, isotherm and thermodynamic studies

Reza Tabaraki<sup>1\*</sup>  
Omran Abdi Sartang<sup>2</sup>  
Zahra Abedini<sup>3</sup>  
Sahar Yousefi<sup>4</sup>

1, 2, 3, 4. Department of  
Chemistry, Faculty of Science,  
Ilam University, Ilam, Iran

\*Corresponding author:  
rezatabaraki@yahoo.com

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### Abstract

A brown alga *Sargassum glaucescens* was used as an inexpensive and efficient biosorbent for the removal of Methyl Red (MR) and Titan yellow (TY) from contaminated water. The effects of various parameters such as contact time, pH, dye concentration, the amount of alga and temperature on dye uptake capacity were investigated. The biosorption capacity of two dyes onto alga was found in the following order: MR>TY. The maximum biosorption capacity was 0.17 and 0.55 mmol/g for TY and MR, respectively. The values of  $\Delta G$ ,  $\Delta H$  and  $\Delta S$  indicated that the biosorption of the dyes on the dried *S. glaucescens* biomass was feasible, spontaneous and endothermic. It was found that the overall biosorption data were best described by the pseudo second-order kinetic model. Several isotherm models were applied to experimental data and among the applied models, the Radke-Prausnitz and Hill isotherm models had the best fit for TY and MR, respectively.

**Keywords:** Biosorption, Titan yellow, Methyl red, *Sargassum glaucescens*, Isotherm.