Biodecolorization of Reactive Red 120 in batch and packed bed column using biochar derived from *Ulva reticulata*

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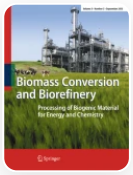

Biomass Conversion and Biorefinery

Aims and scope

Submit manuscript

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Abstract

A seaweed *Ulva reticulata* was used to synthesis biochar, and it was used in the removal of Reactive Red 120 (R120). The optimum thermal pyrolysis temperature was found to be 300 °C, and it was confirmed by proximate and elemental analysis of the biochar. The practical applicability of this biochar was explored by conducting the experiments in batch and continuous mode. An up-flow packed bed reactor was used to study the removal of reactive red 120 in continuous mode. The operating parameters like solution pH, contact time, biochar dosage, temperature, initial concentration were studied. A four-parameter model Fritz-Schlunder-IV and pseudo-first-order kinetic model best fitted the experimental uptake with a correlation coefficient of 0.9996 and 0.9951, respectively. The maximum removal efficiency and uptake capacity of 84.2% and 210.5 mg/g were obtained at operating conditions of pH of 2, biochar dosage of 2 g/L, temperature of 30 °C, and initial concentration of 500 mg/L. The partition coefficient was studied to overcome the limitation of the adsorption capacity, and the highest partition coefficient was obtained as 4.13 L/g at 100%