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## Use of Red Mud activated at different temperatures as a low cost adsorbent of reactive dye

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### Abstract

The bauxite refine residue (Red Mud) is an important waste generated in the aluminum production, and its reuse should be used as a low-cost adsorbent in environmental remediation and industrial effluent treatment, including the reactive blue 19 dye (RB19) used in the textile industry. This study aimed to investigate the thermal treated influence on adsorption of RB19 by red mud, comparing with adsorption capacity of natural red mud. Thermal treatment results in a greater surface area, which results in an increased adsorption capacity due to more available adsorption sites. Adsorption of RB 19 has been found to be best achieved in acidic conditions using red mud heated to 500°C, with an adsorption capacity of 416 mg g<sup>-1</sup> compared to 357 mg g<sup>-1</sup> for untreated red mud. Sodalite can be the main phase related to the adsorption capacity of RB19 on natural and thermal treated red mud. However, with the increase in temperature, there is a partial decomposition of this mineral phase, being this fact responsible for the lowest  $q_m$  values observed in RM800 (337 mg g<sup>-1</sup>).

**Keywords:** Red Mud, Reactive dye adsorption, Isotherms models, Environmental Management.