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Preparation of iron oxide-loaded bamboo charcoals and their trinitrotoluene red water treatment

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ABSTRACT

Magnetic bamboo charcoals were prepared by loading $FeCl_3$ onto bamboo charcoal and then calcinated at appropriate temperatures. The type of iron oxides on bamboo charcoal and the possible reactions in the process of preparation were analyzed by thermal gravimetric analysis, X-ray fluorescence, and X ray diffraction. The sample obtained by calcination at 400˚C was the composite of FeO(OH), α-Fe_2O_3, and bamboo charcoal, while the product given by calcination at 700˚C composed α-Fe_2O_3, Fe_3O_4, and SiO_2. The magnetic bamboo charcoal calcinated at 400˚C had a magnetization of 1.12 emu/g and a slightly higher chemical oxygen demand removal rate to trinitrotoluene red water compared to bamboo charcoal. So, the as-prepared magnetic bamboo charcoals were a kind of useful adsorbents with magnetic separation function.

Keywords: Bamboo charcoals; TNT red water; Iron oxide; Magnetization

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