

Inorganic Anion Removal from Water Using Natural Adsorbents

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Abstract : There is a need for new systems that can be attached to drinking water treatment plants and have the required treatment capacity as well as the selectivity regarding components derived from anthropogenic activities. In a context of high volumes of water and low concentration of contaminants, adsorption/exchange processes are appealing since they meet the required features. Iron oxides such as siderite and malachite, which are respectively based on FeCO_3 and Fe_2O_3 , can be found in nature. In this work, their observed performance, raw or roasted at different temperatures, as adsorbents of some inorganic anions is discussed. Roasted 1:1 FeCO_3 : Fe_2O_3 mixture was very selective for arsenic and allowed a 100% removal of As from a 10 mg L^{-1} As solution. Besides, the 1:1 FeCO_3 and Fe_2O_3 mixture roasted at $500 \text{ }^\circ\text{C}$ showed good selectivity for, in order of preference, arsenate, bromate, phosphate, fluoride and nitrate anions with distribution coefficients of, respectively, 4200, 2800, 2500, 0.4 and 0.03 L g^{-1} .

Keywords : drinking water, natural adsorbent materials, removal, selectivity

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