Surfactant-Modified Clay Composites: Water Treatment Applications

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Abstract The accumulation of various contaminants in water has become a threatening environmental issue, affecting all living creatures. Owing to this fact, mitigating water contamination problems by improving existing technologies and developing potential strategies has become an emerging area of research. Among several approaches for water treatment, adsorption has been attractive since it has unique advantages due to the use of natural and synthetic materials. As a natural adsorbent material, clay minerals are considered superior materials owing to their wide availability, low cost, excellent adsorption performance and cation exchangeability. To enhance the surface properties toward the removal of water pollutants, natural clays are subjected to various modifications. The surfactant-modified clay composites can remove a variety of pollutants than other composites due to the sorption of surfactant onto the external surface and interlayer spacing of clay minerals. This chapter encloses the application of surfactant-modified clay towards the removal of pollutants from water.

Keywords Clay composite · Surfactant · Adsorption · Ion exchange · Water treatment

1 Overview

Safe and clean water is one of the most pivotal requirements for all living creatures and ecosystems on Earth. However, the tremendous increase in the worldwide population and growing industrialization have created a higher demand for available freshwater, while resulting in large amounts of wastewater globally. Direct discharge of polluted water containing a number of complex chemical wastes such as industrial wastes,

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