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Review

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A review on the adsorption of heavy metals by clay minerals, with special focus on the past decade

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Abstract

Adsorption has proved that it is the best process of water treatment technologies, because of its significant advantages. Clays and its minerals are abundantly present, cheap material which is being successfully used as an adsorbent for the removal of toxic heavy metals from aqueous solutions for decades. Clays and its minerals, both in its natural and modified forms, removed various heavy metals from aqueous solution effectively, as extensively discussed in this review. This detailed review compiles last ten years of thorough literature involving current research (2006-2016) and presented along with highlighting the key findings of the adsorption studies using clay minerals. This review article presented the outline of structure, classification, and chemical composition of various clay minerals, and descriptive analysis of their adsorption behaviour. The review confirmed that both natural and modified forms of clay minerals have excellent feasibility for the removal of different toxic aquatic metal pollutants. However, there is still need of modification and recent developments in the synthesis of novel clay materials and their application to adsorb different environmental pollutants leading to improve the pollution control.

Keywords: Clays; Adsorption properties; Types; Chemical compositions; Structure

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