



## Feasibility of montmorillonite-assisted adsorption process for the effective treatment of organo-pesticides

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### ABSTRACT

Over the years, the emergence of pesticides practice has prevailed to be the most intricate environmental turmoil amongst the scientific community. Specifically, pesticides constitute an accumulative, persistent and detrimental impact towards the survival of flora, fauna and environmental matrix. This has inspired a developing research with a variety of treatment technologies. Adsorption is recognized as the most efficient and promising approach, due to the ease of operation, simplicity of design, insensitivity to the toxic substances and superior capability for removing a broad range of pollutants. Its diverse applications, however, are retarded by the high cost of adsorbents and difficulties associated with regeneration. Montmorillonite and its derivatives, a unique group of under-utilized clay-based minerals has been proposed to be a suitable candidate for the treatment of contaminated wastewater. It plays a key role as the natural scavenger of pesticides, due to the abundantly availability, large specific surface area and high adsorptive and ion exchange properties. This paper describes the origin, physical, chemical and physicochemical properties of natural montmorillonite. The preparation procedure, reusability, commercial product and economical evaluation are highlighted. The specific classification, environmental and health implication of organo-pesticide are discussed. The revolution of montmorillonite-assisted adsorption process for the remediation of organo-pesticide was summarized. Additionally, the characterizations, surface chemistry and mechanism investigation are outlined.

*Keywords:* Adsorption; Clay; Modification; Montmorillonite; Pesticide

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