From Soil to Bio-Natural Sources: Exploring the Potential of Algerian Clays

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Abstract

Clays, though originating as simple soil, are composed of specific minerals with unique structures. These structures, categorized as phyllosilicates (layered) or fibrous (like sepiolite and palygorskite), contribute to their diverse properties such as absorption and plasticity.

Due to their varied composition, particularly clays rich in silicon dioxide (SiO_2) and aluminum oxide (Al_2O_3), their applications are extensive. They play a role in construction materials, ceramics (both artisanal and industrial), cement production, pharmaceuticals, water treatment (pollution and dye removal), and even pottery.

This study focuses on the physical and chemical properties of clays from Western Algeria, specifically humidity level, pH, swelling index, and fire-induced colloidality loss. Understanding these inherent properties is crucial in exploring their potential as bio-based materials with diverse applications.