

WATER PURIFICATION BY USING DIFFERENT ORGANOCLAY COMPLEXES

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The cleaning up of contaminated water is one of the most difficult and expensive goal in environmental engineering. Clay minerals are the most important inorganic components in soil for sorption of contaminants, but without modification are ineffective stable sorbents for contaminant compounds. The treatment with surfactants changes the surface properties from hydrophilic to hydrophobic and greatly increases the basal spacing of the layers. [1-4]. This new material, named organoclay, is used in some environmental applications as the removal of contaminants from polluted waters offering a promising device in decontamination planning and environmental remediation. Several routes can be employed to modify clays and clay minerals [5]. Ion exchange with alkylammonium ions is wellknown and the preferential method to prepare organoclays, but clays and clay minerals can also be modified with biomolecules, like proteins, enzymes, amino acids, peptides, etc. [6]. With the aim to develop an effective, safety and economic matrix capable of removing organic contaminants from water for animal and human consumption we compared the behaviour of two organoclays realized by using natural montmorillonite (MMT) and octadecyl-trimethyl-ammonium bromide and bovine serum albumin as surfactants. Tribenuron-methyl a highly active herbicide was used as contaminant test. Tribenuron-methyl solutions containing both the active ingredient and its degradation derivative were tested. Basal spacing (d₀₀₁) of the unmodified and modified clay mineral was determined by X-ray diffraction (XRD), following drying at 25°C. The herbicide retention by MMT and the surfactant-modified MMT was measured by LC/MS. The results of XRD and chemical analyses confirmed the potentiality in the environmental field of both modified clays. The effectiveness of tribenuron-methyl adsorption coupled with the complete removal of its derivative gives account of the usefulness of organoclay systems for the elimination of this kind of pollutant from water in cleaning processes.

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