



## Kinetics of cadmium adsorption by smectite of Oued Tfal (Gafsa Basin)

M. Mhamdi<sup>a,b,\*</sup>, E. Elaloui<sup>a</sup>, M. Trabelsi-Ayadi<sup>b</sup>

<sup>a</sup>Faculty of Sciences of Gafsa, Unit of Research Materials Environment and Energy (06/UR/12-01), Gafsa, Tunisia  
Tel. +216 97338503; Fax: +216 76211515; email: mohsen\_issat@yahoo.fr

<sup>b</sup>Faculty of Sciences of Bizerte, Applications Laboratory of Chemical and Natural Resources and Environment (LACReSNE), Bizerte, Tunisia

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### ABSTRACT

Metals are quickly trapped in the soil and, in particular, in clays, which generally behave as reservoirs of these toxins. This retention is due to the adsorption properties and cation exchange capacity of clays, and we have to control this in order to limit their transport in the biosphere. This will be the subject of the study: the characterization of smectite of the Oued Tfal region in Gafsa (Tunisia) in one hand, and its application in the retention of cadmium through the new method of adsorption, and the study of factors affecting the adsorbability of the metal (nature of clay, ligands, initial concentration, etc.) on the other hand. The total surface area, determined by the methylene blue method, for the raw and purified samples was 556 and 783 m<sup>2</sup>/g, respectively. The adsorption kinetics depend on several parameters. The adsorption capacities of Cd(II) by raw and purified clays are 971 and 1,005 mg/g, respectively in the single element system, confirming the close correlation between the physicochemical properties of the adsorbent and its removal capacity. Cd (II)-clay obeys the Langmuir and Freundlich adsorption isotherms with high regression coefficients. The use of this adsorbent notably decreases the cost of treatment.

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\*Corresponding author.