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Purification of natural clays using physicochemical process. Application for preparation of a new ultrafiltration membrane for Red 80 removal from aqueous solutions

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This paper describes the protocol and the optimization of a purification procedure of two various types of Moroccan clay materials: Marl (smectite-rich clay) of Fez smooth (A) and rough (B).

The purification method was investigated. The impurities were removed prior to separating fine particles. The chemical purification was carried out following a precise protocol in order to eliminate the various impurities (carbonates, iron oxides and organic matter) without affecting the clay minerals. Our approach is based on following and control of this several operations by using a set of analyzes, such as X-Ray Diffraction and Infra-Red (DRX and IR) and imaging microscopic such as Scanning Electron Microscope and Transmission Electron Microscope (MEB or SEM and TEM). As application, the purified fraction of clay is used as deposit on membrane supports prepared from raw clay, utilizing a spin-coating technique to develop the UF membrane. Visual study as well as scanning electron microscope of the prepared membranes shows that the deposited layer is homogenous and free of structural defects. The average pore diameters were determinate to be approximately 75 nm and 90 nm respectively for M1 and M2. Finally resulting UF membranes were tested by measuring the water permeability and the filtration of Red 80 solution.

Speaker Biography

Hanae Ouaddari obtained her engineering degree from Ecole Mohammedia des Ingenieurs in 2004 into Industrial Process Engineering (Major). She then joined the National Center for Scientific and Technical Research as Laboratory Manager for Atomic Emission Spectrometry. In 2015 she joined the Laboratory of Materials Membranes and Environment of Faculty of Sciences and Technologies of Mohammedia, University of Hassan II as PhD student. Since 2018, she has been responsible for the Chemistry Platform, which includes eight laboratories offering analytical services in the fields of molecular chemistry and synthetic chemistry. Her current research interest includes the valorization of Moroccan clays for environmental applications to catalysis, adsorption and ultrafiltration.

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