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Physico-chemical characterization of sand dunes from El-oued region

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Abstract

In recent years, the interest in raw materials has increased due to their physico-chemical properties and also their availability. Sand of particular interest; it is widely used in industry and nanotechnology [1]. The sand in its raw state is used in various fields: as building materials, thermal energy reservoir medium, water filtering material and in bricks and ceramic manufacture [2–4].

However, sand represents the most promising resource of quartz (silicon dioxide) material compared to crystalline hard rocks. Today, high-purity quartz has become a vital mineral, with its particular physicochemical properties being employed in a wide range of nanotechnologies such as glass fabrication, optics and microelectronics, semiconductors and telecommunications. Extracting quartz from sand or extracting silicon from quartz and determining its suitability for different industrial applications require knowledge of the physical and chemical properties of the quartz.

The objective of this study is to identify the minerals sand dunes from different regions of Eloued area and assess the presence of pure quartz in the sand dunes of these regions and determine some crystal structural properties of sand components, by using Fourier-transform infrared spectroscopy (FT-IR), SEM/EDX and X-ray diffraction (XRD).

Keywords:

Porous silica, sand, XRD, SEM, FTIR.

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