

Mineralogical and Geochemical Constraints on the Origin and Environment of Numidian Siliceous Sedimentary Rocks of the Extreme Northwest Tunisia

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Abstract : The present work has set itself the objective of studying non-detritic siliceous rocks of the extreme northwest Tunisia. It aims to examine the origin and their sedimentary depositional environment based on mineralogical and geochemical characteristics. The different sections were located in the area of Babouch and the area of Tabarka. The collected samples were subjected to mineralogical and geochemical characterization using different analytical methods: X-ray diffraction (XRD), geochemical analysis (ICP- AES), isotopic geochemistry ($\delta^{18}\text{O}$), to assess their suitability for industrial use. X-ray powder diffraction of the pure siliceous rock indicates quartz as the major mineral, with the total lack of amorphous silica. Trace impurities, such as carbonate and clay minerals, are concealed in the analytical results. The petrographic examination revealed allowed us to deduce that this rock was deriving from tests of siliceous organisms (the radiolarians). The chemical composition shows that SiO_2 , Al_2O_3 , and Fe_2O_3 represent the most abundant oxides. The other oxides are present in negligible quantities. Geochemical data support a biogenic and non-hydrothermal origin of babouchite silica. Oxygen isotopic has shown that babouchites were formed in an environment with a high temperature ranging from 56 °C to 73 °C.

Keywords : biogenic silica, babouchite formation, XRD, chemical analysis, oxygen isotopic, northwest tunisia

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