

## **Depositional Environment of the Babouchite Rocks of Numidian Formation, Northwestern Tunisia: Mineralogical Study and Geochemical Properties**

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**Abstract :** The present work has set itself the objective of studying non-detritic siliceous rocks in the extreme northwestern of Tunisia. It aims to discuss the origin and depositional environment of siliceous rocks based on petrographic, mineralogical, and geochemical results. The different sections were made in the area of Babouch and the area of Cap-Serrat. The collected samples were subjected to petrographic, mineralogical, and geochemical characterization using different analytical methods: scanning electron microscopy (SEM), X-ray diffraction (XRD), geochemical analysis (ICP- AES), isotopic geochemistry ( $\delta^{18}\text{O}$ ) to assess their suitability for industrial use. These babouchite shows that the mineralogy consists of quartz as the dominant mineral with the total lack of amorphous silica, while clay represents the minor phase. The petrographic examination revealed allowed to deduce that it is a rock of chemical origin deriving from tests of siliceous organisms (the radiolarians). Chemical analyzes show that  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$ , and  $\text{Fe}_2\text{O}_3$  represent the most abundant oxides. The other oxides are present in negligible quantity. Geochemical data support a biogenic and non-hydrothermal origin of babouchite silica. Oxygen isotopic has shown that babouchites are formed in an environment with a high temperature, ranging from  $56^\circ\text{C}$  to  $73^\circ\text{C}$ .

**Keywords :** siliceous rocks, babouchite formation, XRD, chemical analysis, isotopic geochemistry, Northwestern of Tunisia

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