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Biogenic native Sulfur linked to the Neogene deposits from the Riffian Corridors (Northern Morocco): preliminary study and characterization

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Elemental sulfur in sedimentary rocks is commonly associated with evaporites and authigenic carbonates. The genesis of this evaporite hosted native sulfur has been traditionally considered as a result of bacterial sulfate reduction under specific geological and paleogeographic conditions. Some biogenic sulfur occurrences are found in the Mediterranean area associated with the Neogene formations (e.g. Hellin, Lorca, Teruel, Sicily). They are described as interbedded layers in large evaporitic sequences or as sulfur nodules enclosed in secondary gypsum or carbonate deposits. Quite similar geological settings are present in Northern Morocco where several sediment-hosted sulfur showings were noted. However, these potential sulfur occurrences in the Pre-Rif and post-nappe Neogene basins have not been studied and still basically unknown. This work aims to explore these occurrences and assess their potentials using preliminary field, mineralogical and geochemical data. Several potential areas were identified at the Tortono-Messinian formations of Oued Amlil, Arbaa Taourirt, Taghzout Tassa, and Boudinar basins. They show favorable settings composed mainly of gypsiferous marls, carbonate, and organic matter-rich black sediments. In terms of sulfur contents, preliminary XRD data confirmed the presence of elemental sulfur and geochemical analyses show total sulfur content reaching 18.5 wt.%. However, further fieldwork combined with advanced mineralogical and isotopic geochemistry is still necessary for this area to try understanding their paragenesis in comparison with other similar Mediterranean occurrences.