

## **Processes and Controls of organic enrichment of Cenomanian and Turonian source rock across Morocco during the Oceanic anoxic event II**

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Organic matter-rich mudstones were widely deposited in the shallow rift shelf basins and deep marine basins of Morocco during the Late Cenomanian to Early Turonian, taking the form of exceptionally thick, TOC-rich successions. This deposition was coeval with an Oceanic Anoxic Event (OAE2), an extraordinary period distinguished by the uncommonly widespread distribution of OM-rich mudstone deposition and anomalously high sedimentary burial rates on both a regional and a global scale. These rocks are potentially major hydrocarbon source rocks. This study aims to investigate the distribution of mudstones and their hydrocarbon potential in the different paleo-bathymetric settings of basins in Morocco during C/T intervals as well as reconstruct the mechanisms of mudstone deposition related to OAE2 in this area.

Preliminary results through petrographic and mineralogical analysis show that the Upper Cenomanian Azazoul section at Agadir basin represents a shallow-subtidal facies to deep-subtidal environment with evident sea-level fluctuations during the Late Cenomanian. Two sequence boundaries can be recognized in the upper Cenomanian of this section as expressed by lithological changes, fossil assemblages and erosional surfaces. A sea level regression occurred prior to the OAE2, followed by a rapid transgression across the OAE2 interval leading to organic-rich mudstone deposition. Subsequently, sea level fell, indicated by a considerably thick and laterally extensive oyster bed. The upper two mudstones layers, expressed as black, laminated mudstones with high pyrite content, suggest a euxinic and dysoxic environment during this time. Concurrently, the high amounts of kaolinite and absence of montmorillonite might indicate a humid climate during the OAE2 interval in this area. Further organic and inorganic geochemical analysis will be applied to investigate how the OAE2 affected the distribution and quality of source rock in this area.