

Characterisation of clays of Aleg and El-Haria Formations, northeastern Tunisia, for ceramic fabrication

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This study focuses on the mineralogical, geochemical and geotechnical tests carried out on clays of Aleg and El-Haria Formations, collected from the North East Tunisia. The object of this study was to evaluate the potential of these clays to manufacture traditional ceramic products. The clays of the Aleg and El-Haria Formations outcropping in the northeastern Tunisia are richer in clay minerals, while some levels are carbonate and gypsum-rich. The study has proved that these clays are aluminous and siliceous. It has been shown that the clays are characterized by the presence of clay minerals such as illite (up to 80%) and kaolinite associated to a small quantity of smectite.

The chemical analyses carried out on samples reveal tolerated content of Fe₂O₃ (below 7%) and of Na₂O+K₂O (about 4%). These clays are then characterized by a high SiO₂ content (higher than 38%).

These clays adapt to fast drying because their drying shrinkage does not exceed 3.3%. They have a low firing shrinkage and plasticity with the less than 2.5% and 16%, respectively. The firing expansion is also limited. For these reasons, these clays can be used in the manufacturing of ceramic products.

Mots-Clés: clays, mineralogy, geochemistry, ceramic, Aleg Formation, El-Haria Formation

Linking diagenesis to sequence stratigraphy on a prograding oolitic wedge: the Bathonian of western France (Aquitaine Basin)

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Oolitic wedges represent high quality reservoirs for hydrocarbon or thermal water industry. To reduce the uncertainty during the exploration, a better analyse of the geometry and diagenesis is required. To improve our knowledge on the relationships between sequence stratigraphy and diagenesis of such sedimentary records, a detailed outcrop study was carried out on the Bathonian of the northeastern Aquitaine carbonate platform. The study of allochems, early and burial cements, pore space type, and grain contacts on 37 thin-sections allows defining 10 rock fabrics. A depositional model is proposed for three third-order sequences of the Bathonian where different depositional environments are distinguished on a 60 km-long transect across the wedge: inner platform (backshore, foreshore and shoreface), prograding oolitic wedge and offshore. Carbonate production was limited to the inner shallow platform and transported seaward toward the breakpoint where they cascaded onto a 23° slope, leading to the progradation of the platform margin clino beds. During transgressive system tracts, carbonate accumulation remains mostly located on the inner platform. Exportation of carbonate and hydrodynamics increase during regressive system tracts. These system tracts are topped by exposure surfaces or hardgrounds on the inner platform and by lithoclast deposits down the wedge. Aggradation of the deposits on the inner platform and in offshore environments is the consequence of a high tectonic subsidence leading to the creation of 60 m of accommodation space that is filled by carbonate sediments. Third-order sequences may be controlled by eustasy. Early cements other than syntaxial are exclusively located in the inner platform below maximum regressive surfaces corresponding to sedimentation hiatus (exposure or hardground). Their absence within the infralittoral prograding wedge even below maximum regressive surfaces is due to the absence of exposure surfaces combined with high sedimentation rate that inhibits early lithification. Sedimentation hiatus is here the key factor controlling early cements development.

Mots-Clés: infralittoral prograding wedge, carbonate platform, depositional model, diagenesis, rock fabrics, sequence stratigraphy, Jurassic, France