



Sedimentological control on carbonate cementation in the Luxembourg Sandstone Formation

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Abstract

ABSTRACT. *The Luxembourg Sandstone Formation, i.e. a lower Jurassic offshore sandbar complex which was deposited in a general transgressive regime, was studied with the aim to unravel the controlling parameters and variations on calcite cementation. This work was based on a combination of extensive fieldwork, petrographic and geochemical analyses. Cementation started with the development of acicular and equant cement. Both have been replaced in the meteoric realm by ferroan calcite cement. Elongated cemented lenses (10-100 m) are parallel to the bedding planes of cross-stratified layers. Coarse-grained cemented channels have a lensoid outline. Continuously cemented (>> 100 m) layers are present (1) as coarse-grained bioclastic rich layers in finer-grained lithologies (both sands and marls) and (2) at important lithological boundaries. Small nodules composed of sparitic to poikilotopic calcite cements, are aligned parallel to the stratification of the sandstones. The outline and distribution of the lenses is the result of an early cementation process, which affected carbonate-rich strata. Later diagenetic redistribution of unstable carbonate from the uncemented strata enhanced the early diagenetic signature. This resulted in zones containing a large amount of up to 100 m elongated lenses, zones with smaller (1-10 m) lenses and zones without any lenses.*

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