



Linking the distribution of carbonate cement to sequence stratigraphy of delta complex sandstones: evidence from the Roda sandstone Formation (Eocene), South-Pyrenean Foreland Basin, NE Spain

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Variable patterns of calcite and dolomite cementation in delta complex sandstones, which include: (i) continuously cemented layers, (ii) stratabound concretions, and (iii) concretions scattered throughout the sandstone beds, are controlled by the rates of changes in the relative sea level relative to the rates of sediment supply (i.e. the sequence stratigraphic context). Overall, cementation by carbonates was promoted by the presence of abundant carbonate grains, which acted as nucleation sites. The presence of continuously cemented horizons just below maximum flooding surfaces (MFS) in the upper parts of the transgressive systems tract (TST) and below parasequence boundaries (PB) was presumably enhanced by prolonged residence time of the sediment below the seafloor, and hence growth of calcite cement through the diffusion of dissolved carbon, calcium and magnesium ions. Such carbonate cemented horizons act as baffles for fluid flow, and may hence induce reservoir compartmentalization and regional seals to sandstone successions. Conversely, incomplete carbonate cementation (i.e. non-coalesced concretions) occurs in sandstone beds of the regressive systems tract (RST) is attributed to the short residence time below the seafloor owing to high rates of sediment supply.

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