Controls on Cementation in a Chalk Reservoir

In this study, we identify different controls on cementation in a chalk reservoir. Biot's coefficient, a measure of cementation, stiffness and strength in porous rocks, is calculated from logging data (bulk density and sonic Pwave velocity). We show that Biot's coefficient is correlated to the water saturation of the Kraka reservoir and is partly controlled by its stratigraphic sub-units. While the direct causal relationship between Biot's coefficient and water saturation cannot be extended for Biot's coefficient and porosity, a correlation is also identified between the two, implying that some degree of pore filling cementation occurred in Kraka (Alam, 2010). Lack of correlation between Biot's coefficient and Gamma Ray (GR) indicates that the small amount of clay present is generally located in the pore space, thus not contributing to frame stiffness. While there was no compositional control on cementation via clay, we could infer that stratigraphy impacts on the diagenetic process.

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