



## Effect of Pyrite in water saturation evaluation of clay rich carbonate reservoirs

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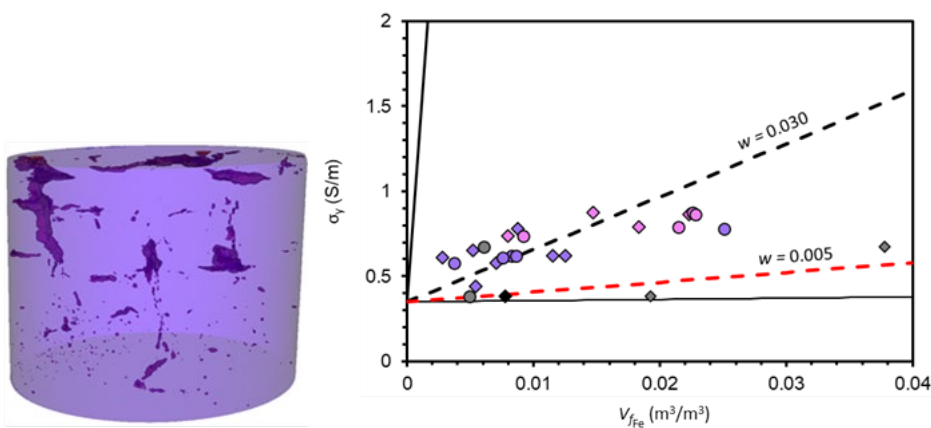
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## Effect of Pyrite in water saturation evaluation of clay rich carbonate reservoirs

Einar M. Storebø; Morten L. Hjuler; Leonardo T. P. Meireles; Ida L. Fabricius

In hydrocarbon reservoirs, log analysis and core measurements provide the fundament for water and hydrocarbon saturation evaluation. In mixed mineral formations containing clay and metallic minerals, the electrical resistivity logging tools used for water saturation calculations are significantly affected due to the conductive nature of these minerals, which could result in an inaccurate saturation profile. In this study we extend Archie's equation for water saturation calculation in the Lower Cretaceous marly chalk formations in the Danish North Sea. Using Hashin-Shtrikman bounds, we investigate the phase mixing in the formation, providing a consistent and practical method for saturation evaluation in mixed mineral heterogeneous formation containing conductive minerals.



HS upper and lower bounds (black continuous) and core matched HS lines weighted to fit Lower Sola and Upper Tuxen formation (red doashed line) and Middle Tuxen and Lower Tuxen formation (black dashed line)