



Contribution ID: 805

Type: **Poster (+) Presentation**

## Calcite dissolution in crude oil and formation of crystals on surface of Mica during Ageing Process

*Wednesday, 2 June 2021 16:00 (1 hour)*

Ageing is a common technique within the oil industry research community to mimic the conditions of crude oil reservoir. Thereby, the porous rock is exposed to crude oil at elevated pressures and temperatures. In particular, the wettability conditions established through this procedure are known to significantly influence the flow behaviour in porous rocks. In this study ageing of mineral surfaces immersed in crude oil at 70°C and 20 Atm pressure has been conducted. During this investigation two experiments were performed. One where calcite and mica were both placed in the ageing cell in crude oil for period of one month and one where only mica was present in the cell. An atomic force microscope (AFM) was then used to study the mineral surfaces such that topographical images of the surfaces of the minerals were produced. In both cases the structure of the adsorbed deposits could be observed and it is clear that the deposits are rather different on the two minerals. In total three different crude oils were investigated in this way. Surprisingly with one of the crudes it was observed that when the mica and calcite were aged together long needle like crystals were formed on the mica surfaces but not on the calcite. Energy Dispersive X-Ray Analysis, EDX in an SEM revealed that these crystals were comprised of calcium and sulfur, and we ascribe this to gypsum formation. Mica itself is not frequently found in reservoir rocks however it has a very similar surface to that of clays which are frequently found in the reservoir. Therefore the findings presented in this study is of particular importance as crystallisation on surface of clay in reservoir would have implications in oil recovery.

### Time Block Preference

Time Block B (14:00-17:00 CET)

### References

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**Session Classification:** Poster +

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