Contribution ID: **803** Type: **Poster (+) Presentation**

The morphology and surface-chemistry of gas-wetting nanoparticles and its effect on the liquid menisci in porous media

Tuesday, 1 June 2021 10:00 (1 hour)

The transformation of the liquid menisci at pore throats is of great importance for mitigating the liquid-blocking effect of condensate reservoirs. Here, we reported a super gas-wetting peanut-like nanoparticle which can facilitate the liquid menisci to transform from concave-shape to convex-shape by coating a super gas-wetting adsorption with high surface roughness. The morphology and surface chemistry of gas-wetting nanoparticles were investigated by SEM, AFM, and XPS analysis. The mechanism of surface modification was further explored by TEM, the adsorption layer coated on the nanoparticle surface can be recognized as monolayer absorption. Gas-wetting model is recommended as the combination of the Wenzel model and Cassie-Baxter model, which is in close agreement with the results of AFM and Contact-angle measurement. Core flooding visualization was performed to identify the effect of gas-wetting alteration on the transformation of liquid menisci in porous media. Results showed that the addition of gas-wetting nanoparticles could decrease the liquid saturations by inducing the transformation of liquid menisci in the pore throat. Additionally, a unique "Amoeba effect"and miscibility effect can synergistically improve the mobility of the oil phase, further enhance the oil recovery.

Time Block Preference

Time Block A (09:00-12:00 CET)

References

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Session Classification: Poster +

Track Classification: (MS3) Flow, transport and mechanics in fractured porous media