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Type: **Poster Presentation**

## **Impact of Novel Nano-particle Solutions on Foam Stability, Wettability Reversal and Interfacial Tension Reduction**

*Wednesday, 1 June 2022 09:20 (1h 10m)*

One of the most important methods for increasing the oil recovery of petroleum reservoirs is gas injection. However, it will not result in good oil recovery in many cases due to a low volumetric sweep efficiency. Foam flooding emerged as a promising solution for improving gas flooding. Still, there are significant concerns regarding the use of foam due to its un-stability in reservoir conditions and the vicinity of crude oil.

For a foam flooding process to be successful, high-performance foaming agents must be selected to produce stable foam. One of these agents could be the use of nanoparticles. In this paper, we have attempted to create foam by making a low-cost nanoparticle, which can be obtained from an industrial waste called fly ash, and addressing its impact on the crucial parameters of the foam EOR process. In the current study, fly ash nanoparticles were first obtained using a specific procedure, and then it was used with a surfactant solution to form foam. Foam performance at bulk volume was evaluated, and results showed that a small amount of fly ash nanoparticle could significantly increase the foam stability in the presence of a cationic surfactant. Foam agents also changed the surface wettability from completely oil-wet to water-wet. Furthermore, it has been observed that fly ash nanoparticles can reduce the IFT between the oil and water phase. In addition to bulk stability tests, flooding tests showed that the nano-stabilized foam could increase the ultimate oil recovery in quasi-two-dimensional (2D) porous media tests.

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### **Country**

Iran

### **References**

### **Time Block Preference**

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

## Participation

In person

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**Session Classification:** Poster

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