



Nanoparticles: Remarkable Future for Oilfield Applications

Ravi Shankar Kumar

Rajiv Gandhi Institute of Petroleum Technology, India

Abstract:

The increased demand of hydrocarbon enforces reduction in oil reserves globally which became one of the major challenge for the world. Thusly, improving oil production from current reservoirs holds the key to meet the current and near future challenges of global energy demands. The development of new technologies such as nanotechnologies showed potential benefits to address energy challenges for several industrial applications including oilfield. Silica Nanofluid, a colloidal solution of solid charged silica (SiO_2) nanoparticles (NPs) suspended in a base fluid (oil/water/glycol/polymeric solutions); possibly beneficial to improve the oil production by governing the matter of facts at nano scale level [1]. Moreover, stability of the formulated nanofluids can be characterized using macroscopic study, dynamic light scattering (DLS) study, ultraviolet-visible (UV-vis) spectroscopy, scanning electron microscopy (SEM) with elemental analysis and mapping techniques followed by rheological study; which is potentially beneficial for oil recovery [2]. Before, oil recovery experiments, the reservoir properties such as wettability alteration and IFT reduction need to be investigated which holds remarkable effect on oil recovery. Therefore, a combination of NPs is proposed in this study and the obtained results showed that the surface coated NPs by surfactant and super molecular structure of $\text{SiO}_2/\text{TiO}_2$ nanocomposites [1-3]. This nanocomposites provides a stable nanofluid of superior capability by maintaining uniform distribution is interesting to avoid early particle aggregation thusly showed incremental oil recovery of more than 78%. Furthermore, NP retention mechanism in porous media has been proposed which showed encapsulation of large clusters in porous media. This study thus discusses the novel fabrication methodology of a stable nanofluid using colloidal aspects for subsurface oilfield applications.



Biography:

Ravi Shankar Kumar is a PhD Scholar at Enhanced Oil Recovery (EOR) Laboratory (Department of Petroleum engineering and Geological Sciences) at Rajiv Gandhi Institute of Petroleum Technology, India (Institute of National Importance) under the Ministry of Petroleum & Natural Gas, Govt. of India. He is working under Dr. Tushar Sharma on Chemical based EOR techniques, Nanofluid Design, CO_2 stabilized foam flooding, Carbon Capturing (Trapping), Rheology of polymer-based nano-fluids, CO_2 trapping, Nano- assisted EOR, etc

Recent Publications:

- Ravi Shankar Kumar, Environ Sci Pollut Res Int .2019
- Ravi Shankar Kumar, Ann Pediatr Cardiol.2019
- Ravi Shankar Kumar, Nat Genet.2017
- Ravi Shankar Kumar, Cell Rep.2017

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