

## **NANOTECHNOLOGY IN PETROLEUM INDUSTRY**

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### **Abstract (600 word limits)**

The world is presently witnessing the advancement and development of a new multidisciplinary technology, “Nanotechnology”. The concepts that seeded nanotechnology was first discussed in 1959 by renowned physicist Feynman. Research on nanotechnology application in the oil and gas industry has been growing rapidly in the past decade, as evidenced by the number of scientific articles published in the field. With oil and gas reserves harder to find, access, and produce, the pursuit of more game-changing technologies that can address the challenges of the industry has stimulated this growth. Nanotechnology has the potential to revolutionize the petroleum industry both upstream and downstream, including exploration, drilling, production, and enhanced oil recovery (EOR), as well as refinery processes. It provides a wide range of alternatives for technologies and materials to be utilized in the petroleum industry. Nanoscale materials in various forms such as solid composites, complex fluids, and functional nanoparticle-fluid combinations are key to the new technological advances. Variety of material hierarchies like nanofluids, nanocatalysts, nanoemulsions and nanocoatings in the upstream, midstream and downstream have explored. It is worth noting that the nanoparticles can reduce the viscosity of oil, increase the mobility ratio, and alter the reservoir permeability. Depending on the operational conditions of EOR methods, some nanoparticles perform more effective than other methods and lead to differ in EOR. However, tertiary fluids used for recovery or EOR process interact with the reservoir rock/ oil system where we EOR techniques are receiving substantial attention. Current studies on nanomaterials are seen as potential solutions to most of the challenges associated with the traditional EOR techniques. The objective of this is to present a wide range of knowledge and expertise related to the nanotechnology application in the petroleum industry in general. The challenges and future research directions for nanotechnology in petroleum industry..

### **Biography (200 word limit)**

Ahmed El-Tahan 27 years, the degree of Bachelor in petrochemical Engineering (Pharos University in Alexandria) experienced engineer in petroleum and petrochemical engineering with expertise in work over operation and petrochemical operation. Now work in Nanotechnology and advanced materials central lab and I study (Master in nanocatalyst in petroleum refining and petrochemical) in the Faculty of Engineering, Cairo University..

## References (With Hyperlink)

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