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Application of Nanoparticles for Oil Recovery

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The oil industry has, in the last decade, seen successful applications of nanotechnology in completion systems, completion fluids, drilling fluids, and in improvements of well constructions, equipment, and procedures. However, very few full field applications of nanoparticles as an additive to injection fluids for enhanced oil recovery (EOR) have been reported. Many types of chemical enhanced oil recovery methods have been used in fields all over the world for many decades and have resulted in higher recovery, but the projects have very often not been economic. Therefore, the oil industry is searching for a more efficient enhanced oil recovery method. Based on the success of nanotechnology in various areas of the oil industry, nanoparticles have been extensively studied as an additive in injection fluids for EOR. This book includes a selection of research articles on the use of nanoparticles for EOR application. The articles are discussing nanoparticles as additive in waterflooding and surfactant flooding, stability and wettability alteration ability of nanoparticles and nanoparticle stabilized foam for CO2-EOR. The book also includes articles on nanoparticles as an additive in biopolymer flooding and studies on the use of nanocellulose as a method to increase the viscosity of injection water. Mathematical models of the injection of nanoparticle-polymer solutions are also presented.

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