

Accepted Manuscript

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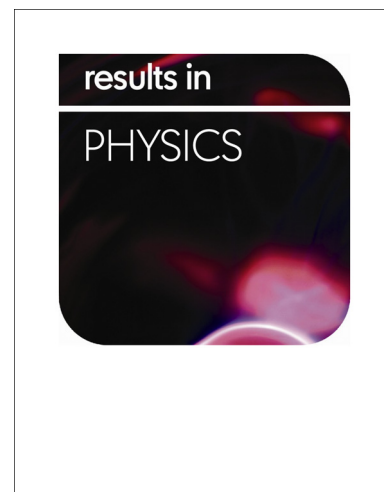
PII: S2211-3797(17)31514-0
DOI: <https://doi.org/10.1016/j.rinp.2018.01.072>
Reference: RINP 1229

To appear in: *Results in Physics*

Received Date: 11 August 2017
Revised Date: 22 December 2017
Accepted Date: 31 January 2018

Please cite this article as: Soleimani, H., Khurram baig, M., Yahya, N., Khodapanah, L., Sabet, M., Demiral, B.M.R., Burda, M., Impact of Carbon Nanotubes based nanofluid on Oil Recovery Efficiency using Core Flooding, *Results in Physics* (2018), doi: <https://doi.org/10.1016/j.rinp.2018.01.072>

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Impact of Carbon Nanotubes based nanofluid on Oil Recovery Efficiency using Core Flooding

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Abstract. This study aims to investigate the influence of carbon nanotubes based nanofluid on interfacial tension and oil recovery efficiency. Practically multi-walled carbon nanotubes were successfully synthesized using chemical vapour deposition technique and characterized using X-ray diffraction and Field Emission Scanning Electron microscope in order to understand its structure, shape, and morphology. Nanofluids are one of the interesting new agents for enhanced oil recovery (EOR) that can change the reservoir rock-fluid properties in terms of interfacial tension and wettability. In this work, different concentration of carbon nanotubes based fluids were prepared and the effect of each concentration on surface tension was determined using pendant drop method. After specifying the optimum concentration of carbon nanotubes based nanofluid, core flooding experiment was conducted by two pore volume of brine and two pore volume of nanofluid and then oil recovery factor was calculated. The results show that carbon nanotubes can bring in additional recovery factor of 18.57 % in the glass bead sample. It has been observed that nanofluid with high surface tension value gives higher recovery. It was found that the optimum value of concentration is 0.3 wt% at which maximum surface tension of 33.46 mN/m and oil recovery factor of 18.57 % was observed. This improvement in recovery factor can be recognized due to interfacial tension reduction and wettability alteration.

Keywords—Carbon Nanotubes (CNTs), Interfacial Tension, Enhanced Oil Recovery (EOR), nanofluid

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