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An experimental study of the effects of graphene oxide (GO) nanoparticles in enhanced oil recovery (EOR)

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Over the past decade, the use of nanoparticles to improve the process of enhanced oil recovery (EOR) has received much attention from researchers. Most nanoparticles are described as an EOR chemical process in which wettability conditions are altered, interfacial tension is lowered, and viscosity is altered to aid oil recovery[1-3]. The main goal of this work is to investigate the effect of graphene oxide nanoparticles in EOR. So first, Graphene oxide was synthesized by the modified Hummer method and nanofluid was prepared using it. Nanofluid effects on surface tension, interfacial tension, wettability, viscosity, density, and recovery factor at 50 ppm and 100 ppm were examined. Graphene oxide nanoparticles are stable in water due to the electrical charge being negative of nanoparticles in water. But adding salt nanofluids decreases stability. To stabilize the graphene oxide salt water, Several methods were used, but the best way is adding a stabilizing agent. The results of the study showed that graphene oxide nanoparticles reduce interfacial tension, reduce the contact angle of a drop of oil, and a slight increase in viscosity and density occurs. Reducing the interfacial tension increases the recovery factor. The results of the waterflooding show an increased recovery factor when injecting graphene oxide nanofluids with salt 10000PPM. In nanofluid injection, due to the lack of stability of nanoparticles in porous media pressure increases. the methods required for the stabilization of the nanoparticle in the reservoir oil and should be further investigated.

.***Keywords:*** graphene oxide, nanoparticle, EOR,

References

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