The effects of Graphene oxide(GO) on the destabilization of Asphatene oil emulsions

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Graphene oxide (GO) has earned great attention within the scientific fraternity due to its unique properties. It has proven to be a highly efficient, rapid and universal demulsifier to break up the oil-water emulsions. For application of GO in emulsions, it's therefore very important to understand the GO adsorption behaviors at the oil-water interface.
The aim of this research was to apply GO to separate crude oil emulsions from a contaminated river. In the present work, the effects of GO concentration (0-2.5mg/l), asphaltene concentration (25wt %) in oil phase and SDS (0.5-1.0wt %) in aqueous phase on the stability and morphology of the emulsions was studied. The adsorption mechanisms of GO at the asphaltene-water interfaces in presence of sodium dodecyl sulfate (SDS) were also examined by static/dynamic interfacial tension measurements using pendant drop and maximum bubble pressure methods. The results showed that the GO displaced the SDS molecules and had more significant effect on the IFT. Indeed; the IFT values reduced with increase of GO concentration until an optimum value of 1mg/l of GO concentration.