

## **Transportation of Heavy Omani Oil Using Stabilized Oil-in-Water Emulsion**

**Rabha Said AL-Omairi**

### **Abstract**

In this study, viscosity reduction of Omani heavy oil was investigated using stabilized oil-in-water emulsions. Various factors that affect the stability and viscosity of the oil-in-water (O/W) and water-in-oil (W/O) emulsions were analysed. These parameters are oil content (40–80%), surfactant concentration (1, 3, and 5 wt %), salt concentration (0.2 and 2.0 wt %), and polymer concentration (10, and 100 ppm). The surfactant used in this study was Triton X-100, which is a non-ionic surfactant. The polymer used was high-molecular-weight anionic polyacrylamide. It is found that addition of surfactant stabilizes O/W emulsions with viscosity reduction of 100% below the phase inversion oil content.

The optimum concentration to produce O/W emulsions without salt addition is found to be 3 wt% since it allows higher oil content before the viscosity sharply increases due to phase inversion. The addition of salts negatively affects the viscosity reduction only above the phase inversion oil content. However, it negatively affects stability of emulsions prepared using 40 and 50 % oil content. The most important result of this study is the use of minute amount of polymer (below 100 ppm) to induce very high viscosity reduction without the need for surfactant.

This would have positive impact on the economics of the application. The stability of the polymer-stabilize O/W emulsions is lower than that using the surfactant. However, it can be enhanced by increasing the polymer dosage.