Oil Removal from Oilfield Produced Water, North Rumaila by Combination Coagulation-Flocculation and Microfiltration Technique

Abstract - The Southern Oil Company, which is operated in North Rumaila oilfield in Basrah/Iraq, is one of the important companies which produced huge amounts of produced oilfield water. The aim of this study is to treat the produced water by hybrid methods: the process of coagulation-flocculation and microfiltration technique (ceramic membrane) to remove the oil content and improve the water quality to meet the allowable limit of reinjection into the reservoir. Poly-aluminum chloride (PAC), and Ferric Chloride (FeCl₃.6H₂O) coagulants were used separately and in combination with cationic polyelectrolyte (PE). After produced water was treated with different doses of coagulant, it was passed through the Microfiltration technique/ceramic membrane (0.5µm) to reach the allowable limit for reinjection. It was found that the best value of oil content after passing through ceramic membrane is 0.2 mg/L at FeCl₃.6H₂O dose (10 mg/L) combined with PE dose (0.6 mg/L), which was less than the allowable limit for re-injection, (5) ppm.

Keywords - Produced water; Coagulation; Flocculation; Ceramic Membrane, Oil Content.