

## Reclaiming polymer-flooding produced water for beneficial use: Salt removal via electrodialysis

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Received 14 January 2010; Accepted in revised form 11 June 2010

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### ABSTRACT

This paper discusses the use of electrodialysis (ED) to remove salts from polymer-flooding produced water (PFPW) in order to meet confecting polymer solution standards. Specifically, the ED treatment of PFPW with total dissolved solids (TDS) concentrations and varying cations and anions distributions was evaluated at three voltage settings. The removal rates of cations, anions, and TDS increased rapidly with time at the same voltage; their removal rates also simultaneously increased with voltage. With Neosepta® CMX-SB/AMX-SB membranes, cations and anions were generally found to be removed in the following order (from the fastest to the slowest):  $\text{Ca}^{2+} > \text{Mg}^{2+} > \text{K}^+ \approx \text{Na}^+$  and  $\text{Cl}^- > \text{SO}_4^{2-} > \text{CO}_3^{2-} > \text{HCO}_3^-$ . The viscosity of the polymer solution confected by treated PFPW was found to be superior compared with the polymer solution confected by fresh water.

*Keywords:* Electrodialysis; Polymer-flooding produced water; Total dissolved solids; Water treatment; Removal rate

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