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Four compartment mono selective electro dialysis for separation of sodium formate from industry wastewater

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Abstract

A process of separation of sodium formate and sodium thiosulfate from sodium dithionate processing industry effluent by selective electro dialysis membrane process was investigated. A mono selective anion exchange membrane (Selemion ASV) and two cation exchange membranes 7000S (CEM) were used to make four compartment membrane cell for electro dialysis process. The recovery of sodium formate and thiosulfate was performed from industrial plant effluent at an optimum current density of 30 mA/cm^2 . The purity of the recovered sodium formate was 87% where current efficiency was about 70%. The recovered sodium formate was confirmed by Ultra violet- visible (UV-Vis) spectroscopy and ^{13}C Nuclear magnetic resonance (NMR) spectroscopy. Limiting current density of 21.6, 45 and 75 mA/cm^2 was observed at different flow rates such as 240, 540 and 840 mL/h respectively. The dilution factor and optimum current density in the efficiency of this process were discussed.

Keywords

Sodium formate, Selective electro dialysis, Limiting current density, Ion-exchange membranes.

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