



Selective removal of dodecyl sulfate during electrolysis with aluminum electrodes

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ABSTRACT

Electrolyses with aluminum electrodes were performed to control the removal of dodecyl sulfate (DS) from aqueous solutions. When electrolyses were conducted in 0.1 M HCl solution and in the presence of 6.9–13.8 mmol L⁻¹ of DS the pH increased and electrogenerated Al³⁺ ions and DS anion led to the formation of a precipitate after an induction period. The abatement of DS anion was about 80% at a concentration of 13.8 mmol L⁻¹, when the molar ratio DS/Al was near 3. For electrolyses carried out in 0.1 M NaCl solution, the pH increased from 5 to 9.4 and an alumina precipitate was formed. The removal of DS anion was less efficient than in acid solution. The abatement did not depend upon the DS concentration in the range 6.9–13.8 mmol L⁻¹ and it slightly increased until 20% with the electrolysis time. These results were in agreement with a DS anion adsorption on electro-generated alumina which was investigated. The adsorption capacity was found at 0.865 mmol g⁻¹ of alumina. This selective removal of DS anion, thanks to a pH control, was applied in the recycling of a deinking wastewater.

Keywords: Surfactant; Dodecyl sulfate; Electrocoagulation; Electrolysis; Aluminum

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