World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:8, No:08, 2014

Treatment of Oil Recovery Water Using Direct and Indirect Electrochemical Oxidation

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Abstract : Model solutions of pentanol in the salt water of various concentrations were subjected to electrochemical oxidation using a dimensionally stable anode (DSA) and a platinised titanium cathode. The removal of pentanol was analysed over time using gas chromatography (GC) and by monitoring the total organic carbon (TOC) concentration of the reaction mixture. It was found that the removal of pentanol occurred more efficiently at higher salinities and higher applied electrical current values. When using a salt concentration of 20,000 ppm and an applied current of 100 mA there was a decrease in concentration of pentanol of 15 %. When the salt concentration and applied current were increased to 58,000 ppm and 500 mA respectively, the decrease in concentration was improved to 64 %.

Keywords : dimensionally stable anode (DSA), total organic hydrocarbon (TOC), gas chromatography mass spectrometry (GCMS), electrochemical oxidation
Conference Title : ICEMSR 2014 : International Conference on Environmental Monitoring, Simulation and Remediation
Conference Location : Venice, Italy
Conference Dates : August 14-15, 2014

Open Science Index, Environmental and Ecological Engineering Vol:8, No:08, 2014 publications.waset.org/abstracts/11461/pdf