Applicability of Electrochemical Technology for Treating a Real Petrochemical Effluent by Electro-generated Active Chlorine Species

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doi: 10.20964/2020.10.66

Received: 17 April 2020 / Accepted: 18 August 2020 / Published: 31 August 2020

This work aims to investigate the treatment of a real petrochemical effluent (commonly named produced water (PW)) by electro-generated active chlorine species using Ti/Ru_{0.3}Ti_{0.7}O₂, Ti/Pt and BDD anodes in a batch cell by applying 45 mA cm⁻². Chemical oxygen demand (COD) and spectrophotometric measurements were carried out to follow the elimination of organic matter as well as the concentration of active chlorine species was determined at the end of the treatment. Results clearly indicated that, removal efficiencies about 42% and 52%, in terms of COD, were achieved with BDD and Ti/Pt anodes, respectively. Conversely, Ti/Ru_{0.3}Ti_{0.7}O₂ anode reached up to 85% of organic matter elimination, as consequence of the efficient production of active chlorine species (ClO₂⁻, ClO₂, Cl₂) by the catalytic action of the anode during the electrochemical treatment.

Keywords: active chlorine, indirect electrochemical oxidation, mineralization organic matter, produced water.

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