



## COD removal from fruit-juice production wastewater by electrooxidation electrocoagulation and electro-Fenton processes

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Received 18 November 2012; Accepted 23 February 2013

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### ABSTRACT

Studies were carried out on the treatment of fruit-juice production wastewater with high (20713 mg/L) chemical oxygen demand (COD) content and the removal of COD by electrooxidation (Eox), electrocoagulation (EC), and electro-Fenton (EF) processes. In the Eox process, graphite anode and titanium cathode electrodes were used in direct oxidation and together with the addition of NaCl, direct and indirect oxidation was applied to break the pollutants and therefore remove COD from wastewater. In the EC process, iron or aluminum anodes were used to remove COD from wastewater. In the EF process, the Fenton process, which is realized by adding hydrogen peroxide to the EC process where iron anodes and titanium cathode electrodes are used, is applied in order to remove COD from wastewater. The results obtained from the electrochemical methods were compared with each other. COD removal was realized respectively, 52.4% at the end of 60 min and 64.7% after 360 min for Eox, 59.1% for EC by aluminum anode electrodes, and 61.3% for EC by iron anode electrodes and finally, 84.4% for EF with the addition of 10 mL H<sub>2</sub>O<sub>2</sub> at the end of 25 min. According to these results, the most effective method for the removal of COD was the EF process.

*Keywords:* Fruit-juice wastewater; Electrooxidation; Electrocoagulation; Electro-Fenton; COD

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