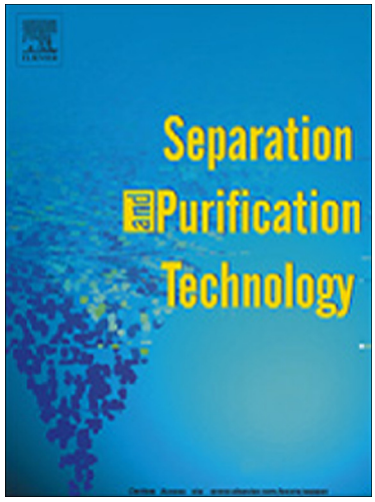


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Fuat Ozyonar, Bunyamin Karagozoglu

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# Treatment of Pretreated Coke Wastewater by Electrocoagulation and Electrochemical Peroxidation Processes

Fuat Ozyonar[1*] and Bunyamin Karagozoglu[1]

[1]*Department of Environmental Engineering, Cumhuriyet University, 58140 Sivas, Turkey*

**Corresponding author: Fuat Ozyonar*

*E-mail address: fozyonar@cumhuriyet.edu.tr, fuatozyonar@gmail.com*

*Phone: +90 346 219 10 10; fax: +90 346 219 11 77*

## Abstract

In this study, treatment of pretreated real coke wastewater by Electrocoagulation process (EC) and Electrochemical Peroxidation process (ECP) using direct pulse current was investigated. Air stripping process of ammonia was used as a physicochemical process for the pretreatment of wastewater. In the present study, ECP process has been offered to remove chemical oxygen demand (COD), total organic carbon (TOC), phenol, cyanide ($CN^-$) and thiocyanate ($SCN^-$) from coke wastewater. The efficiency of the process and settling characteristic of waste sludge were investigated through changing some operating parameters such as initial pH, initial $H_2O_2$ concentration and current density. Direct pulse current (DPC) was used to prevent the passivity or polarization of electrodes and to increase removal efficiency. Under the optimum operation conditions at the EC and ECP process (pH 3, current density 200A/$m^2$, initial $H_2O_2$ 10 g/L (for ECP), operation time 20 min.), the removal efficiencies of COD, TOC, phenol, $CN^-$ and $SCN^-$ were observed to be 26%, 20%, 9%, %9.2 and 8.2% (for EC) and to be 92.0%, 90.0%, 97.6%, 90.0% and 93.6% (for ECP), respectively. Operating costs for the EC and ECP process were calculated as 1.46 € /$m^3$ and 5.64€ /$m^3$.

[1]*Corresponding author: Fuat Ozyonar
*E-mail address: fozyonar@cumhuriyet.edu.tr,*
*Phone: +90 346 219 10 10; fax: +90 346 219 11 77*