

# Kinetics study of CWPO of phenol wastewater over Cu-ZSM-5/PSSF catalysts prepared by ion-exchanged method

Yanjie Wu<sup>1</sup>, Huiping Zhang<sup>2</sup>, and Ying Yan<sup>3</sup>

<sup>1</sup>South China University of Technology

<sup>2</sup>Affiliation not available

<sup>3</sup>south china university of technology

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## Abstract

Cu-ZSM-5 was prepared on the paper-like sintered stainless steel fibers (PSSF) by ion-exchange method for catalytic wet peroxide oxidation (CWPO) of phenol in a fixed bed reactor. The prepared Cu-ZSM-5/PSSF catalyst was characterized by SEM, BET, XRD, FT-IR and UV-vis, respectively. And the effects of different catalyst bed height, reaction temperature and feed flow rate on catalytic performance were investigated to obtain optimum reaction condition. Finally, the catalytic reaction kinetics analysis over Cu-ZSM-5/PSSF catalyst were carried out with the Power-rate Law Kinetic model. The experimental results showed that the reaction order was the first-order reaction, and the activation energy of the oxidation reaction was  $E_a=72.9$  kJ/mol. The initial oxidation rate equation ( $-r_{A0}=5.36 \times 10^8 e^{-72994/RT}$  CA) was obtained for phenol degradation using Cu-ZSM-5/PSSF catalyst.

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