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Catalytic wet air oxidation for water purification

Korrin Saunders
Cardiff University, UK

The generation of hazardous waste waters from a variety of industrial processes poses a serious environmental threat. Catalytic wet air oxidation (CWAO) is a growing economical and environmentally friendly process for the removal of toxic organic compounds found in such wastewater streams. Using a continuous 3-phase trickle bed reactor, this project focuses on the complete oxidation of phenol as model organic pollutant. Of the catalysts screened, platinum/silicon carbide proved the most successful, in terms of activity. An explanation is proposed for the increased reaction rates seen when using hydrophobic catalyst supports such as SiC; the presence of a 'surface gas envelope' on hydrophobic supports allows for a secondary mass transfer route of oxygen from the gas phase to the catalyst surface, prohibited by more common hydrophilic catalysts. Investigations were carried out to further optimize the silicon carbide catalysts, and improve mass transfer limitations, with the overall aim of reducing the high energy requirements associated with CWAO, and thus the overall cost and environmental impact.

Biography

Korrin Saunders has completed her Master's in Chemistry at Cardiff University, and is currently involved with the Centre for Doctoral Training (CDT) program in Catalysis at Cardiff University, University of Bristol and the University of Bath. As part of the CDT, she has obtained a Master's in Research and is currently in her final year of her PhD. Her PhD works are within the Cardiff Catalysis Institute and the School of Chemical Engineering at the University of Bath.

saundersk2@cardiff.ac.uk

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