

## Removal of heavy metals from mining impacted water by an electrocoagulation-ultrafiltration hybrid process

Dilini Kumarasinghe, Liam Pettigrew, Long Duc Nghiem\*

*School of Civil Mining and Environmental Engineering The University of Wollongong, Wollongong, NSW 2522, Australia  
Tel. +61 2 4221 4590; email: longn@uow.edu.au*

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### ABSTRACT

In this study, the use of an electrocoagulation-ultrafiltration (EC-UF) hybrid system for the treatment of mining impacted wastewater was investigated. A model wastewater solution containing copper, lead, cadmium and other constituents representative of mining impacted wastewater was used in this investigation. The effects of key operational parameters including electrolysis time, current density, and solution pH on the performance of the EC and EC-UF systems were systematically investigated. The removal rates of copper and lead by the EC process were consistently higher than that of cadmium. It is probable that the removal mechanism of cadmium was different from that of the base metal copper and lead. Results reported here indicate that an EC-UF hybrid system could be very effective in removing heavy metals at high solution pH. At an acidic condition, the removal efficiency of heavy metal by both EC and UF reduced dramatically. However, the overall removal efficiency by the hybrid EC-UF system remained quite high. Results reported here suggest that EC and UF can complement each other very well for optimum removal efficiency.

*Keywords:* Electrocoagulation; Heavy metals; Mining wastewater; Ultrafiltration

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\* Corresponding author.