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Fluoride, copper and combined fluoride-copper removals from semiconductor wastewater by electrocoagulation

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Treatments of fluoride (F), copper (Cu) and F-Cu from semiconductor-based silicon etching rinse baths by electrocoagulation (EC) using aluminum plate electrodes were investigated in this study. The effects of important process variables such as current intensity, initial pH and initial concentration on the removal efficiencies of F and Cu were evaluated. Removal efficiencies for F and Cu in the single system were found at about 99% at optimum operating conditions. The highest removal efficiencies were achieved at pH 3 for F and between pH 3 and 5 for Cu containing synthetic wastewaters. Experiments were conducted with different F/Cu ratio when Cu concentration was kept constant and F concentration was increased, the highest removal efficiency was observed at lower concentrations. EC study provided high removal efficiencies of F and Cu from semiconductor synthetic wastewater.

Biography

Nadjib Drouiche is a senior researcher at the Centre de Recherche en Semi-Conducteurs pour l'Energetique (ALgeria). He is also the director of the Crystal Growth and Metallurgical Processes (CCPM) and Head of the environmental team. His research interests include adsorption, membrane processes, electrochemical processes using sacrificial anodes, Advanced Oxidation Processes, and recovery of by-products from industrial waste. He has published more than 80 papers in ISI-ranked journals with more than 1000 citations and his h-index is 21. Dr. Drouiche was awarded TWAS-ARO YAS Prize 2012: "Sustainable Management of Water Resources in the Arab Region".

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