

32a Removal of Ammonia from Semiconductor Wastewater

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Microtechnology is relatively new but has already proven to be effective in many fields ranging from pharmaceutical synthesis to food quality control to microscale fuel cells. This project studies its application to wastewater treatment, particularly in the semiconductor industry. Semiconductor manufacturing sites produce large amounts of water contaminated with ammonia. The proposed microreactor system is based on a membrane separation process which removes ammonia from the wastewater stream to a countercurrent gas stream. Waste generation is minimized by reacting the ammonia in the gas stream with sulfuric acid to create ammonium sulfate, a primary ingredient in many fertilizers. A mathematical model is employed to design a scaled up process based on experimental results. The scaled up process is designed to be used by semiconductor manufacturers throughout the country to comply with local Publicly Owned Treatment Works (POTW) pretreatment standards.