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***ICEEM/03 – ENVIRONMENTAL ENGINEERING  
SECTION***

***Water Supply and Wastewater Treatment***

**EXERGY CONSUMPTION MITIGATION IN THE  
ELECTRODIALYSIS OF THE AMMONIUM SULFATE  
AQUEOUS SOLUTIONS**

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**Abstract**

A mathematical model was derived to describe the specific exergy consumption for the ammonium sulfate recovery by electro dialysis (ED) from diluted solutions. The model includes two new equations established on the basis of experimental data: the equation of the solution conductivity and the equation of the concentration vs. time. A TetraCon 196-1.5 conductivity cell was employed to measure the conductivity. A laboratory- scale ED unit type TS 2-5 from Eurodia/Tokuyama was used to generate the kinetic curves concentration vs. time. The equations of the mathematical model were numerically solved for different constant operating parameters. The voltage applied exerts the most important influence. At 303 K, 100 L/h flow rate, 1980 s ED time, and a voltage of 10 V the specific energetically consumption was of 2.25 kWh/kg ammonium sulfate separated. This is closed to that reported by other researchers for lactate separation in similar conditions.

*Keywords:* conductivity measurements, kinetic experiments, mathematical modeling, energy consumption

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