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IMPLEMENTATION OF DESALINATION TECHNOLOGY IN AMMONIUM THIOSULFATE MANUFACTURING

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Ammonium thiosulfate (ATS) is an inorganic compound with applications in agriculture, particularly as a fertilizer. Its production process generates substantial waste heat, which can be used for seawater desalination, an especially valuable resource in regions dependent on desalinated drinking water.

This study explores two methods for utilizing ATS-derived heat in desalination:

Direct thermal desalination, where steam from ATS production drives evaporation in a brine evaporator and indirect power generation, where steam turbines convert waste heat into electricity to operate reverse osmosis (RO) systems.

The analysis evaluates thermal efficiency, energy consumption, and water recovery rates for both approaches, comparing their advantages and limitations. While evaporative desalination leverages steam for boiling seawater, the RO method relies on turbine-generated electricity to power high-pressure pumps. The objective is to determine the most energy-efficient integration, minimizing waste while enhancing desalination output. Findings provide a technical and environmental assessment of coupling ATS production with desalination, exploring options to improve sustainability in water-scarce regions.

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