

Title (en)
PROCESS TO RECOVER AMMONIUM BICARBONATE FROM WASTEWATER

Title (de)
VERFAHREN ZUR RÜCKGEWINNUNG VON AMMONIUMBICARBONAT AUS ABWASSER

Title (fr)
PROCÉDÉ DE RÉCUPÉRATION DE BICARBONATE D'AMMONIUM À PARTIR D'EAUX USÉES

Publication
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Application
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Abstract (en)
[origin: WO2020131116A1] The present invention is a process, a method, and system for recovery and concentration of dissolved ammonium bicarbonate from a wastewater containing ammonia (NH₃) using gas separation, condensation, and crystallization, each at controlled operating temperatures. The present invention includes 1) removal of ammonia from waste (sludges, semi-solids, and solids and liquids) without the use of chemicals at a temperature of at least 80 degrees Celsius, 2) condensing the gaseous containing ammonia, carbon dioxide and water vapor to remove water vapor concentrating the amount of gaseous ammonia and carbon dioxide, 3) concentrating the ammonia and carbon dioxide in the water by established means, such as concentrating the gas using partial condensation followed by passing the concentrated gas through an absorption column at a temperature of between about 20 and 50 degrees Celsius to form dissolved ammonium carbonate and ammonium bicarbonate, or total condensation followed by dewatering using reverse osmosis, and 4) crystallizing concentrated dissolved ammonium carbonate and ammonium bicarbonate at a temperature of less than about 35 degrees Celsius to form solid ammonium bicarbonate and ammonium carbonate.

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Citation (search report)
• [X] US 2016200613 A1 20160714 - ORENTLICHER MORTON [US], et al
• [L] US 3970739 A 19760720 - SHIRAISHI TATSUO, et al
• [A] DE 3603739 A1 19860807 - CESKOSLOVENSKA AKADEMIE VED [CS]
• See references of WO 2020131116A1

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