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Carbon sequestration and solution mining - the bicarbonate solution

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Abstract

This project examined a novel process concept for the conversion of CO₂ gas into solid sodium bicarbonate using an aqueous NaCl solution. The application is for KCl production. The novel concept is to use a chemical agent to raise the pH of the salt solution, enable precipitation, and then to regenerate the agent. This project has shown that the agents studied successfully enabled sodium bicarbonate to precipitate with precipitation occurring within minutes and with a decent yield (>60%). This project also showed that the agent could be regenerated. Heat is required for the regeneration which could be adequately met from either the heat in the salt solution where it has been mined deep underground via solution mining, or could be met from the surplus low value heat generated at a fossil fuel power station, or from other sources.

Key words: Salt caverns, CO₂ sequestration, Potash.

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