



SUSTAINABLE CALCIUM HYDROXIDE PRODUCTION FOR GREEN CEMENT

[View U.S. Patent Application Publication No. US-2022-0081311 in PDF format.](#)

WARF: P200241US02

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The Invention

UW-Madison researchers have developed a new sustainable process to manufacture calcium hydroxide as a way to reduce the CO₂ emissions associated with cement production. This process utilizes a low-temperature ammonia cycle to produce calcium hydroxide from a wide range of calcium-bearing industrial waste streams such as recycled concrete and coal ashes. Calcium hydroxide is produced through an aqueous leaching - precipitation cycle aided by ammonia. In the first reaction, calcium ions are extracted from calcium-bearing minerals using ammonium chloride, which produces calcium chloride, leached mineral residue, and ammonia gas. In the second reaction, the calcium chloride and ammonia gas from the first step are collected and reacted to precipitate calcium hydroxide. This step utilizes the low and inverse solubility of calcium hydroxide to induce precipitation at elevated temperature and mild pressurization. After the calcium hydroxide precipitates are separated, the ammonium chloride is recycled for use in the first reaction. This process cycle can use crystalline, amorphous, or hydrated phases of calcium silicates/aluminate/aluminosilicates as the solid feedstock, which are abundant in a wide range of industrial waste streams including crushed concrete, coal ashes, steel and iron slags, etc.

Additional Information

For More Information About the Inventors

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Tech Fields

- [Clean Technology : Monitoring, remediation & waste reduction](#)
- [Engineering : Manufacturing & construction](#)

For current licensing status, please contact Michael Carey at mcarey@warf.org or 608-960-9867