Pulverized rocks used to strip CO2 from large emitting plants

December 6 2012

Researchers in Quebec are developing a process that would see steel, coal and cement plants as well as oil and gas facilities remove most of the carbon dioxide (CO2) from their emissions through chemical reactions with various types of crushed rocks in the stacks.

The project is adapting and improving the process by which CO2 reacts with different minerals to form carbonates, a benign but valuable by-product that can then be sold to other commercial operations.

Lead investigator Dr. Guy Mercier, of the Institut national de la recherche scientifique (INRS), says he and his team are developing an economically attractive process that could easily be integrated into existing facilities and use simple and abundant rocks, waste concrete or tailings from mines in Quebec.

"You take the waste material, the rock, concrete or mine tailings, and crush it to make a powder and then you send that powder up the chimney with the gas," says Mercier. "The resulting chemical reaction removes 80 per cent of the CO2."

It also forms carbonate byproducts that can be sold to a variety of different industries for use as a refractory material or as an alcaline agent in wastewater treatment. "This will allow companies to profit while sequestering CO2, says Mercier. "They can create new jobs instead of creating pollution."

"It's a lower cost, low pressure, low temperature technology that doesn't require capturing purified CO2," Mercier says. "There are a lot of engineering challenges in this but we are well on our way to achieving success."

Mercier is working with an international team of researchers from INRS, the University of Calgary and the University of Melbourne. The project is also being undertaken with industrial partners Holcim Canada, a building materials and construction company, and SIGMA DEVTECH, a consulting company for startups. The research team will be reacting various magnesium and calcium rocks available in mine tailings mines with the gaseous emissions (containing CO2) of a Holcim cement plant with the participation of the cement plant staff in a chemical reactor (a plant in itself).

Provided by Carbon Management Canada

Citation: Pulverized rocks used to strip CO2 from large emitting plants (2012, December 6) retrieved 13 August 2024 from https://phys.org/news/2012-12-pulverized-co2-large-emitting.html