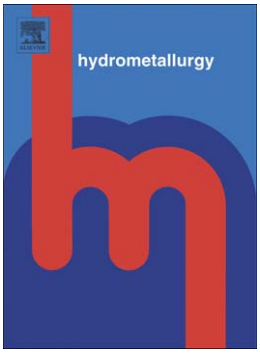

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EXTRACTION OF MAGNESIUM FROM FOUR FINNISH MAGNESIUM SILICATE ROCKS FOR CO_2 MINERALISATION – PART 2: AQUEOUS SOLUTION EXTRACTION

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Abstract

Extraction of magnesium from minerals serpentinite, amphibolite and diopside for mineral carbonation in Finland are compared. In this part two of the study, the extraction in an aqueous solution reactor is the main focus, using solvents as ammonium bisulphate (ABS), ammonium sulphate (AS) and hydrochloric acid. The advantage using a mixture of ABS and AS as solvent is analysed. A process suggested containing an aqueous solution extraction reactor is compared to a mineral carbonation process with a thermal solid/solid extraction step. Extracted elements, mainly magnesium, are measured with atomic absorption spectroscopy (AAS). The two serpentines tested in the study showed sufficient reactivity required for an efficient carbonation process, while for the two other minerals reactivity were insufficient. The best extraction results obtained of the two serpentines give a binding capacity of CO_2 is 292 and 260 kg CO_2/ton rock. Reactivity with a minimal amount of water, and recirculation and regenerating solvent salts is analysed.

Keywords: Magnesium extraction, Mineral Carbonation, Ammonium Salts, Serpentine, Diopside, Carbon Capture and Storage by Mineralisation