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PURPOSE OF THE ABSTRACT
The use of solid waste from the phosphate industry in CO2 carbonation

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Abstract
Phosphogypsum is a naturally occurring part of the process of reacting phosphoric acid (H3PO4) which is an essential component of many modern fertilizers. For every ton of phosphoric acid made, from the reaction of phosphate rock with sulphuric acid, about 5 ton of phosphogypsum are created. There are three options for managing phosphogypsum: disposal or dumping, stacking, use-in, for example, agriculture, construction, ?. This paper presents the valorization of phosphogypsum for CO2 capture. There are several CO2 sequestration methods, mineral carbonation is one of the alternatives considered for CO2 sequestration for the permanent and safe storage of CO2. This consists of inducing the artificial weathering of alkaline minerals such as dairy steel making, brines, flyash and phosphogypsum to produce stable carbonate solids. The novelty of this work is its experimental approach, which explores all variables (sources of alkalinity low cost, pH, time, CO2 flow rate) for optimized conditions that maximize the degree of carbonation. CO2 uptake is determined by direct thermogravimetric tests. The results indicate that high carbonation efficiency is obtained for solids at basic pH and moderate treatment times. The precipitation of physically detectable calcium carbonate crystals was assessed using scanning electron microscopy (SEM). However, further elaboration of this method may allow for the preparation of pure calcite crystals from industrial phosphogypsum.

FIGURES

FIGURE 1

FIGURE 2

KEYWORDS

Phosphogypsum | Mineral sequestration | Carbon dioxide | Carbonation

BIBLIOGRAPHY