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# Carbon dioxide disposal in carbonate minerals

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## Abstract

We introduce a safe and permanent method of CO<sub>2</sub> disposal based on combining CO<sub>2</sub> chemically with abundant raw materials to form stable carbonate minerals. Substantial heat is liberated in the overall chemical reaction so that cost will be determined by the simplicity and speed of the reaction rather than the cost of energy. Preliminary investigations have been conducted on two types of processes, involving either direct carbonation of minerals at high temperature or processing in aqueous solution. Promising raw materials are identified in both cases. For aqueous processing, a chemical cycle employing well-known reactions is proposed for digesting and carbonating the raw material. Cost estimates, based on comparison with standard industrial and mining practice, are encouraging. Necessary raw materials are surveyed and vast quantities are found to be easily accessible. Amounts are sufficient to allow utilization of the large known fossil-fuel reserves while avoiding build-up of atmospheric CO<sub>2</sub>.



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