## CO2 storage in superfast magnesite reaction?


Magnesite (or magnesium carbonate **MgCO3**) is an abundant mineral that stores huge quantities of atmospheric CO2 in its crystal structure. One ton of rock can fix half a ton of CO2, but this well known geological process is not f takes hundred of thousands of years to do so at the Earth's surface under normal temperatures and pressures. So a presentation by Ian M. Power, professor at the Trent University, Ontario at the Goldschmidt Geochemistry Conference in Boston made quite a splash: he and his co-authors claim to have found a way to speed the reaction enormously, going down to about 72 days. They use micro-particles of polystyrene as a catalyst according to a ScienceDaily article.



It seems to good to believe, and some critics object that professor I. Power is "seriously over-optimistic". CCS (carbon storage and sequestration) has been overhyped for a long time as the solution to continue using fossil fuels without problems from CO2 emissions into the atmosphere. But pushing CO2 in liquid form into the underground is energy-intensive; a subterranean lake of liquid CO2 waiting to escape makes many people nervous. If this CO2 could be definitively stored away in solid rock (neglecting weathering), the whole CCS problem would become much more acceptable.

In the abstract the authors explain that they found that magnesite forms by direct precipitation from aqueous solutions at low temperatures (3 – 10°C). Using carboxylated polystyrene microspheres this precipitation was found to happen in 72 days. The process does not need any energy input and is several magnitudes faster than natural magnesite formation.

Will this be the coming way to carbon sequestration, or even, as some speculate, to direct CO2 removal from the atmosphere, making all hugely expensive and complicated former CCS trials crash into a dead-end?




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