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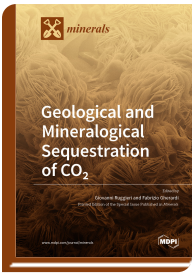
Special Issue Reprint

Geological and Mineralogical Sequestration of CO_2



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The rapid increasing of concentrations of anthropologically generated greenhouse gases (primarily CO2) in the atmosphere is responsible for global warming and ocean acidification. The International Panel on Climate Change (IPCC) indicates that carbon capture and storage (CCS) techniques are a necessary measure to reduce greenhouse gas emissions in the short-to-medium term. One of the technological solutions is the long-term storage of CO2 in appropriate geological formations, such as deep saline formations and depleted oil and gas reservoirs. Promising alternative options that guarantee the permanent capture of CO2, although on a smaller scale, are the in-situ and ex-situ fixation of CO2 in the form of inorganic carbonates via the carbonation of mafic and ultramafic rocks and of Mg/Ca-rich fly ash, iron and steel slags, cement waste, and mine tailings. According to this general framework, this Special Issue collects articles covering various aspects of recent scientific advances in the geological and mineralogical sequestration of CO2. In particular, it includes the assessment of the storage potential of candidate injection sites in Croatia, Greece, and Norway; numerical modelling of geochemical–mineralogical reactions and CO2 flow; studies of natural analogues providing information on the processes and the physical–chemical conditions characterizing serpentinite carbonation; and experimental investigations to better understand the effectiveness and mechanisms of geological and mineralogical CO2 sequestration.

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