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Mineral Carbon Capture and Storage in Igneous Rocks

Guest Editor:

Dr. Kevin T. M. Johnson
1. Department of Earth Sciences, School of Ocean and Earth Science and Technology, University of Hawaii at Manoa, Honolulu, HI 96822, USA
2. Marine Geology and Geophysics, Division of Ocean Sciences (OCE), National Science Foundation, Alexandria, VA 22314, USA

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Message from the Guest Editor

Reduction of ever-increasing greenhouse gas emissions and mitigation of the effects of increasing atmospheric concentrations of these gases are among the most pressing challenges to society in this century. In situ mineral carbonation provides an effective means to achieve this. Geological carbon capture—via fluid–rock reactions that remove carbon from air or surface waters—provides an alternative to industrial CO_2 capture and transport. Near-surface reaction of CO_2-bearing fluids with silicate minerals in ultramafic and mafic rocks (e.g., chemical weathering of peridotites and basalts) produces stable carbonate minerals. The chemical weathering of silicate rocks is the principal mechanism by which the Earth regulates atmospheric CO_2 concentrations over geological timescales to maintain Earth's climate within a relatively narrow temperature window of habitability. This Special Issue presents current, state-of-the-art research on many aspects pertinent to utilizing and enhancing natural reactions that convert atmospheric CO_2 to stable carbonates in mafic and ultramafic rocks.

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Editor-in-Chief

Prof. Dr. Leonid Dubrovinsky
Bayerisches Geoinstitut,
University Bayreuth, D-95440
Bayreuth, Germany

Message from the Editor-in-Chief

Minerals welcomes submissions that report basic and applied research in mineralogy. Research areas of traditional interest are mineral deposits, mining, mineral processing and environmental mineralogy. The journal footprint also includes novel uses of elemental and isotopic analyses of minerals for petrology, geochronology and thermochronology, thermobarometry, ore genesis and sedimentary provenance. Contributions are encouraged in emerging research areas such as applications of quantitative mineralogy to the oil and gas, manufacturing, forensic science, climate change, geohazard and health sectors.

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Contact Us

Minerals Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland

Tel: +41 61 683 77 34
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minerals@mdpi.com
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