Special Issue

Diamond Formation and Decarbonation under Lithospheric Mantle Pressures and Temperatures

Message from the Guest Editor

Studies on the stability of natural carbonates and the features of CO2 fluid generation during mantle-crust interaction are critical for the reconstruction of the processes of the global carbon cycle, including mantle metasomatism, natural diamond formation, as well as formation evolution of carbonated eclogites and peridotites. The key factors that determine the stability of carbonates in the mantle are pressure, temperature, oxygen fugacity, and environmental composition. Their variations can lead to phase transitions and changes in the structure of carbonates, initiate processes of partial melting, decomposition or various reactions involving carbonates. The latter include diamond-forming redox reactions between carbonates and reduced phases (metallic iron, carbides, sulfides, reduced fluids and melts) and decarbonation reactions that occur when carbonates interact with silicates and/or oxides and lead to the formation of CO2 fluid and the crystallization of newly formed silicates. Decarbonation is one of the most common fluid-generating processes occurring during the interaction of the subducting slab with mantle rocks.

Guest Editor

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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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