

0800h

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Petrological And Geochemical Characteristics Of Magmatic Melts At Gorely Volcano, Kamchatka, Russia

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We conducted an integrated mineralogical-geochemical study of the structural complexities of all products from the Gorely volcanic edifice to determine genetic conditions. Gorely, in southern Kamchatka, is a large, long-lived shield-type volcano that is currently in an eruptive phase. Prior eruptions occurred in 1980 and 1984. Several complexes compose the overall volcanic structure: 1) ancient Pra-Gorely volcano which measures 20-25 km in diameter; 2) a 12 km diameter caldera; 3) thick stratum of ignimbrites totaling a volume of 100 km³; 4) post-caldera eruption cinder cones; 5) modern edifice – "Young Gorely" composed of three large superimposed cones and 11 associated craters forming a NW-SE trending intra-caldera ridgeline; 6) a complex of 40 modern subsidiary cones on the slopes of "Young Gorely". We present materials of the Gorely volcano geological structure, peculiarities of its eruptive activity, new geochemical data, and results of crystal-phase microprobe investigations to define paragenetic relationships. Geochemical analysis typifies two series of evolution at Gorely. Pra-Gorely volcano is represented by a suite of compositions ranging from basalt to rhyolite, and contains Hi-Mg basalts (MgO about 10wt percent). Comparatively the "Young Gorely" edifice is composed of only basalt to andesite compositions. Here we present a reconstruction of the evolution of Hi-Mg melts within magma chambers and conduits and the differences in magmatic series generation of Pra-Gorely and "Young Gorely". Both volcanic series of Gorely volcano form genetic series with similar evolutionary stages. We suggest fractionation of an upper mantle peridotite as a common means to produce both series under different geodynamic conditions. The similarity of these two series indicates that the evolution of Gorely's melts is not due to the incorporation of crustal components.

8410 Geochemical modeling (1009, 3610)

8413 Subduction zone processes (1031, 3060, 3613, 8170)

8439 Physics and chemistry of magma bodies

Volcanology, Geochemistry, Petrology [V]

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