

2009 Portland GSA Annual Meeting (18-21 October 2009)

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Presentation Time: 9:00 AM-6:00 PM

EVOLUTION OF THE MAGMATIC MELTS AT GORELY VOLCANO (KAMCHATKA)

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Gorely volcano is the largest eruptive center in Southern Kamchatka. It is comprised of three structural units: Pra-Gorely volcano; thick ignimbrite complex, associated with a caldera forming eruption; modern edifice named 'Young Gorely'. Geochemical studies have been conducted on all structural units of the Gorely volcanic edifice to determine their genetic conditions.

After geochemical analysis two evolution series were found. First, Pra-Gorely volcano is represented by a suite of compositions ranging from basalt to rhyolite, with in this series, high-Mg basalts were discovered. Second, Young Gorely edifice is composed of only basalt, andesite and dacite. The reconstruction of chemical evolution trends shows that both volcanic series of Gorely volcano share the same genetic history with similar evolutionary stages. We suggest fractionation of an upper mantle peridotite as a common means to produce both volcanic series as a result of which the evolution of all rocks was generated.

The magmatic series of Pra-Gorely and Young Gorely volcanoes were formed under different geodynamic conditions. Between these two series was a powerful stage of caldera formation, during which 100 km³ of ignimbrites were emplaced. The 12-km diameter caldera collapse was the catalyst for a large-scale reorganization of the volcanic feeding system. Following caldera collapse, Young Gorely volcano was formed by activity inside the caldera and shows very similar evolutionary trends to that of Pra-Gorely volcano. Therefore, it can be confidently stated that crustal components are practically absent in the evolution of the series, and the compositional range is attributed directly to the evolution of the magmatic melts of Gorely volcano.

Microprobe analyses conducted on Ol and Px phenocrysts of Gorely volcano lavas, show that there were at least two stages of crystallization during the magmatic melt evolution.

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[General Information for this Meeting](#)

Session No. 248--Booth# 201

[Volcanology \(Posters\)](#)

Oregon Convention Center: Hall A

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