



Behavior of volatiles in the magmatic reservoirs of large-scale eruptions of Pleistocene-Holocene calderas of Iturup Island (Kuril Islands)

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Abstract

The paper represents results of the study of pre-eruption volatile and fluid behavior in magma chambers beneath two large calderas at the Iturup Island (Great Kuril island chain). Both magmas have similar dacitic compositions and were composed of plagioryholitic melts, magmatic phenocrysts and restite minerals. Minerals crystallized at 850 °C under strongly oxidized conditions (NNO+1). Magma storage of the VI eruption was shallow (~1 kbar) and high water contents leads to degassing and release of the H₂O-CO₂ fluid. The magma reservoir of the LP eruption was located deeper (>1 kbar) and similar to VI water contents in magma resulted in appearance of Mg-hornblende, rather than degassing. The study revealed that behavior of water and carbon dioxide largely depends on the pressure. In both VI and LP magma reservoirs all studied volatile components (H₂O, Cl, F, S) behaved like incompatible elements and were concentrated by silicate melts.

Keywords

the Kuril Islands, calderas, acid melts, magmatic focus,
melt inclusions

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