

Geochemistry and solute fluxes from volcano-hydrothermal systems of Kunashir, Kuril Island arc

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Kunashir is the southernmost island of the Kuril archipelago. Two dormant volcanoes at the south of the island, Golovnin (543 m) and Mendeleev (888 m) are characterized by a strong hydrothermal activity. Mendeleev volcano is a stratovolcano with extrusive dome and four thermal fields on its slopes, whereas the Golovnin caldera hosts two acid lakes and several thermal grounds. Thermal fields of both volcanoes discharge vapors at boiling point temperature and acid SO₄-Cl to neutral Na-Cl hot waters. We generalize all published data and our own results of the 2015 field campaign on the geochemistry of these volcano-hydrothermal systems and present new data on the chemical (major and trace elements including REE) and isotopic (H, O, C, He) composition of thermal fluids and gases. For the first time the outflow rates of the draining streams have been measured and the solute fluxes from both volcano-hydrothermal systems have been estimated. The drainage from the Golovnin caldera is provided by only one stream to the Sea of Okhotsk, whereas the drainage from Mendeleev volcano is realized by several streams to the Pacific Ocean and to the Sea of Okhotsk. The two volcanoes are similar with respect to the hydrothermal flux of magmatic chlorine and sulfur (~ 8 t/d of Cl and 8 t/d of SO₄ each one). This work is supported by the RSF grant #15-17-20011