



Pressure and temperature calculations for Öräfajökull volcanoes magmas, Iceland

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The Öräfajökull Volcano is an ice-covered stratovolcano located by the southeast coast of Iceland, about 50 km from the divergent plate boundary. Öräfajökull is the highest volcano in Iceland with its highest peak, Hvannadalshnjúkur, rising ~2110 m above sea level.

Two eruptions have occurred in Öräfajökull during historical time (the past 1130 years); a plinian eruption in 1362 with a Volcanic Explosivity Index (VEI) of 6 and an effusive flank eruption in 1727 (VEI ~4). Both eruptions had devastating effects and the eruption in 1362 is thought to have been the largest explosive eruption in Europe since Mt. Vesuvius in Italy erupted in 79 BC. Detailed knowledge about other eruptions in Öräfajökull is yet to be obtained. However, studies of tephrocronology in the Öräfi district confirm that the volcano was significantly active during the Holocene. Öräfajökull has been dormant since its last eruption with almost no seismic activity until 2016. In the last two years the seismic activity has increased, and the volcano has shown significant inflation. The main aim of this study is to calculate pressure and temperature by analyzing crystals of several lava flows from six different locations in Öräfajökull. The purpose is to understand at what depth and temperature the crystals started to grow in the crust to gain a better understanding of the plumbing system below the volcano.

This important in order to increase our understanding of this complex stratovolcano and develop reliable predictions for future eruptions.