KRAFLA LAVAS 1975-1980 — CHEMICAL VARIATION

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ABSTRACT

Basaltic magma is continuously being fed into magma reservoirs at about 3 km beneath the Krafla volcano in North Iceland. At the same time the North Iceland plate boundary is undergoing a major rifting episode on a 100 km long fault swarm that intersects the Krafla volcano. Most of the magma resides a short period in the magma reservoirs and is injected into the fault swarm as 10-15 km long segments are rifted.

About 0.6×10^9 m^3 of magma are estimated to have flowed through the magma reservoirs and about 1 % have been erupted in short lived fissure eruptions and injections into boreholes. The lavas show significant chemical variation (MgO 5.2—8.6 %) and clear signs of mixing during eruption ad indications of extensive mixing before eruption. The apparent end members are not related by fractionation of minerals observed in the lavas which suggests that at least two separate reservoirs are involved.

The new lavas are erupted from a discontinuous fissure with the more primitive lavas found at the northern end. This reflects the regional distribution of postglacial lavas in the area as basalts erupted north of the Krafla volcano are dominantly more primitive than those associated with the volcano.