



The first geochemical account of basaltic and silicic rocks from the immense Hofsjökull central volcano, Mid-Iceland

D. Holm and K. Grönvold

Nordic Volcanological Center, Reykjavik, Iceland, dorthe@hi.is / Phone: +354 663 8284

South Iceland has two parallel rift zones and an apparent aseismic, leaky transform in Mid-Iceland connects the northern part of the Western Rift zone to the younger Eastern rift zone.

Mid-Iceland has been highly magmatically productive during most of the Quaternary and is dominated by the vast central volcano Hofsjökull. The volcano is ice covered and has a 600 m deep ice filled caldera with three rhyolitic nunataks near the caldera rim. Basalts and rhyolites outcrop at the glacier margin. These rocks have, so far, been chiefly unexplored.

The virtually slow spreading rate of the oblique rift assures that volcanic centers of the Mid-Iceland plate boundary are almost stationary within the crust during the life-span of the center ($1/2$ to 1 million years).

The formation of rhyolites in Iceland are interpreted by others, as being formed either by fractional crystallisation of mantle derived magma; by partial melting during pro-grade metamorphism, caused by down going mass-flow of hydrated basaltic rocks; or as an amalgamation of the two (AFC).

Preliminary modelling of geochemical, whole rock, major and trace element data accompanied by data from microprobe glass analyses and mineral chemical data specify that basalts from the northern rim of the Hofsjökull glacier are unrelated to basalts and silicic rocks further to the south in the central volcanic complex. Moreover compatible trace element ratio diagrams indicate that rhyolitic rocks from the nunataks may be related to intermediate dykes at the eastern rim of the Hofsjökull glacier and basaltic rocks from Arnafell hið Mikla (south eastern Hofsjökull). Normal mineral zoning in

the intermediate dykes at the eastern rim suggests fractional crystallization as the main petrogenetic process.

Rock suites in Mid-Iceland may well have formed through fractional crystallization along NE-SW striking *en echelon* fissures, created as a result of book shelf faulting, as is the case for the less mature transform zones on the Reykjanes peninsula and the South Iceland Seismic Zone.