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DIVERSE INTRUSIVE AND VOLCANIC ROCKS IN THE AXIS OF THE ABANDONED SNAEFELLSNES RIFT, NORTH CENTRAL ICELAND

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The Skagi volcanic zone, in north-central Iceland, lies near the axis of the Snaefellsnes rift, the most recently abandoned ridge segment formed by the interaction of the Mid-Atlantic ridge and the Iceland hotspot. The northwestern tip of Vididalsfjall, in the southwest Skagi zone, was previously mapped as a silicic intrusion. New mapping has revealed five distinct units.

The units include a 400-meter thick series of basalt flows with a few well-exposed individual flows up to 2 meters thick. These flows are similar to the dominant basalt type of the Skagi zone: iron-rich tholeiite. A shallow rhyolite intrusion is the most extensive unit. A fine- to medium-grained granite unit appears to cut the rhyolite intrusion and is in sharp intrusive contact with a medium- to coarse-grained gabbro. These coarser grained intrusions are exposed in a narrow EW-trending shear zone. Field relations between the intrusions and an extensive volcanic breccia are unclear.

Fifteen samples were analyzed by XRF and ICP-MS. The basalts (47.4-54.1 wt.% SiO₂) are somewhat evolved (6.7-3.0 wt.% MgO) tholeiites (12.5-15.7 wt.% Fe₂O₃); one plots as basaltic andesite and one is extremely silicified. These flows all show slight LREE-enrichment with no Eu anomaly. On spider plots, the basalts match OIB and EMORB well but have negative Sr anomalies. The intrusive rhyolite (75 wt.% SiO₂) shows LREE-enrichment with a small negative Eu anomaly. The granite varies in SiO₂ from 72.2 to 57.5 wt.% as it approaches the gabbro contact. The REE pattern is very similar to the intrusive rhyolite. The gabbro (42-43 wt.% SiO₂) is clearly the result of accumulation and shows nearly flat REE in one sample and slight LREE-enrichment in the other. The REE patterns of all units are very similar and major element variation diagrams show linear trends suggesting evolution by fractional crystallization from a common source. Preliminary analysis suggests the basalts are related to both MORB and enriched sources. Comparison with modern Icelandic basalts might reveal better how the ridge evolved over time as the rift evolved toward abandonment.

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