

GEOCHEMISTRY OF EYJAFJÖLL, A VOLCANO IN SOUTHERN ICELAND

by

BARBARA ARNEY

Los Alamos National Laboratory,
University of California,
Los Alamos, New Mexico 87545, USA

ABSTRACT

Eyjafjöll is a central volcano in the eastern neo-volcanic zone of southern Iceland. Its last eruption occurred from 1821 to 1823. Most of the volcano is composed of transitional alkali basalt and basaltic andesite. Rhyolites and dacites have been erupted only from the central, glacier capped, caldera. Good stratigraphic coverage was obtained from three traverses from the base of the mountain to the ground moraine on top. The best section was sampled on the deeply dissected southern side of the volcano.

Major element whole-rock analysis of 64 samples and microprobe determined compositions of selected phenocryst phases have been used to develop a fractionation model relating the various rock types produced by the volcano. Considerable subtraction of olivine from a hypothetical primary magma is required to produce even the least silicic compositions observed

at the surface. More silicic compositions can be derived from one of two «parent» compositions, chosen from the least differentiated rocks sampled, by further subtraction of plagioclase, clinopyroxene, and magnetite with minor ilmenite and olivine. No separate source or mechanism is required to produce the small quantities of rhyolite found, as they can be derived by fractionation. There is some evidence that the magmas of Eyjafjöll have become less alkalic and more silica-saturated with time.

(This paper was not read at the Symposium)