

HETEROGENEITY OF PHONOLITIC PUMICE DEPOSITS FROM TENERIFE, CANARY ISLANDS

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ABSTRACT

The island of Tenerife has an extensive Quaternary phonolitic pyroclastic series, comprising plinian pumice-fall deposits, ignimbrites, and pyroclastic surges. The dominant petrological feature of these pumice deposits is their geochemical and petrographical heterogeneity. Evidence is presented for three causes of heterogeneity: assimilation of roof-rock by the magma, resulting in less evolved compositions of the first-erupted pumice; zonation of the magma chamber, causing a change to intermediate compositions among the last products of an eruption; and magma mixing, where mafic and banded tephra are distributed more or less randomly through a particular pumice deposit.

Evidence for magma mixing is particularly abundant. A detailed petrographic and electron microprobe study has shown that simultaneous mixing of basaltic, intermediate, and phono-

litic magmas has repeatedly occurred in the history of the volcano: for example, phenocrysts representative of the entire magmatic range on Tenerife have been found, together with a compositionally variable glass, *within a single pumice clast*. These relationships are interpreted as the result of the disruption of a stably-zoned magma chamber, containing phonolitic and intermediate liquids, by intruding basaltic magma. The frequent incidence of heterogeneity among the recent phonolitic products of Tenerife volcano, and the occurrence of similar deposits on other island volcanoes, suggests that uncontaminated evolved liquids may be scarce in the oceanic setting.

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