

Textural and Geochemical Evidence for Remobilized Cumulates on Tenerife, Canary Islands

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The Las Cañadas Volcanic Edifice on Tenerife represents nearly 2 Ma of alkaline volcanic activity with bimodal erupted products (basanite-phonolite). Chemically and thermally zoned ignimbrites cover most of the island, and many deposits contain both crystal-poor and crystal-rich juvenile clasts. Crystal-rich clasts typically host a rich mineral assemblage (with anorthoclase + pyroxene + biotite + Fe-Ti oxides and accessory apatite ± haüyne ± amphibole). Partly disaggregated glomerocrysts containing most or all of these phases suggest growth in a high-crystallinity environment, while feldspar resorption indicates remobilization of this high-crystallinity mush following hot recharge. Major element compositions of feldspars (typically Or₁₀₋₄₀ and <An₂₀) in these crystal-rich clasts imply crystallization from evolved alkaline melts, and common reverse zoning in Ba (high Ba rims) suggests significant feldspar resorption followed by partial regrowth from a Ba-enriched melt. Bulk rock geochemistry of Tenerifan rocks shows a large population of low-Zr, high-Ba, high-K samples, which cannot be linked to the liquid line of descent. These samples, which include the crystal-rich juvenile clasts in ignimbrites, indicate significant crystal accumulation zones, which later become entrained in the late-erupted parts of large-volume explosive events.