Mt. Vulture alkaline carbonatite ring complex reconstruction using holocrystalline ejecta.

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The Mt. Vulture (Basilicata, Southern Italy) is an alkaline carbonatite volcano whose extrusive rocks are mafic, alkaline with different Na/K ratios, mainly SiO_2 undersaturated, with relatively high contents of Cl, S, F, and CO_2 [1]. Their composition ranges from basalts to basanites to tephrite to phono-tephrites and phonolites. Along with this magma suite have been erupted mantle xenolith bearing-carbonatitic melilitites and carbonatites [1, 2]. Holocrystalline ejecta have been studied in detail to reconstruct the composition of the subvolcanic/plutonic bodies beneath Mt. Vulture. The ejacta are haüine-bearing clinopyoxenites with variable content of olivine, amphibole and phlogopite, haüine foidolites with some nepheline and leucite, haüine-calcite-syenites, syenites, calcite melilitolites, K-feldspar bering-alvikites and a sovite [3]. There is a continuous variation in the modal and geochemical composition between clinopyroxenite and foidolite, that might be related to the chemical evolution shown by the extrusive rocks. The ejecta show an enrichment trend in LILE, LREE and HFSE consistent with fractional crystallisation evolution, from clinopyroxenites to foidolites and from foid-syenites to syenites. The foid-syeniites are rich in U, Pb, Sr, LREE and contain britholite, wholerite, U-pyrochlore. The most evolved syenite however, is less enriched in REE but contains elevate content of U and HFSE. The sovite contains intercumulus alkali carbonates. A glimemerite vein in a haüine foidolite contain REE-rich apatite, shorlomite and U-pyrochlore. These findings suggest that alkaline-alogen-H_2O-CO_2 rich fluids can be formed during sub-volcanic/plutonic fractional crystallisation. These fluids can produce fenitisation and/or can form mineralisation enriched in REE and HFSE.

The ejecta suite studied represents the intrusive complex beneath the volcano and these rock types are typical of ring complexes in alkaline carbonatite volcanoes.

[1] Stoppa & Principe (1998) *J. Vulcanol. Geotherm. Res.* **80** 137-153. [2] Stoppa et al., (2008) *Lithos* **103** 550-556. [3] Rosatelli et al., (2000) *Min. Mag.* **64** 155-164. [5]