

Nb and REE minerals from the Virulundo carbonatite (Namibe, Angola)

Torró, L.^{1*}, Villanova, C.¹, Castillo, M.¹, Campeny, M.¹,
Olimpio, A.² & Melgarejo, J.C.¹

¹Dept. Cristallografia, Mineralogia i Dipòsits Minerals,
Universitat de Barcelona, Catalunya, Spain
(*lisardtorro@hotmail.com)

²Depto. de Geologia, Universidade Agostinho Neto, Luanda,
Angola

The Virulundo carbonatite is located in SW Angola, in the Namibe province, and is one of the biggest carbonatite outcrops in the world. It is a Cretaceous subvolcanic plug, which belongs to the Parana-Namibia-Angola alkaline-carbonatitic province. It is found intruding Early Archean granitoids, which are fenitized on the contact.

The structure consists of a central circular body of massive carbonatites, 1.5 km in diameter, surrounded by concentric ring dikes of carbonatitic breccia. The central body is made up of a sequence of calcitic, dolomitic and ankerite intrusions. Finally, some microtrachytic dikes crosscut the ensemble.

Pyrochlore is widespread in all the above mentioned units. It occurs as euhedral crystals, less than a millimetre in size. The crystals show a complex texture with 2 main generations of pyrochlore: a) primary magmatic, displaying concentric zoning, and b) secondary, found in irregular replacements along grain borders, small fractures and other discontinuities. Zoning in primary pyrochlore mainly reflects changes in the F content and the cation filling in the A position (Fig. 1). The secondary pyrochlore is strongly enriched in Ba and Sr, and depleted in F, Ca and Na (Fig. 1). The vacancies also increase in the secondary pyrochlore. Secondary pyrochlore is intimately associated with barite, thus suggesting that the hydrothermal alteration of pyrochlore takes place in oxidizing conditions.

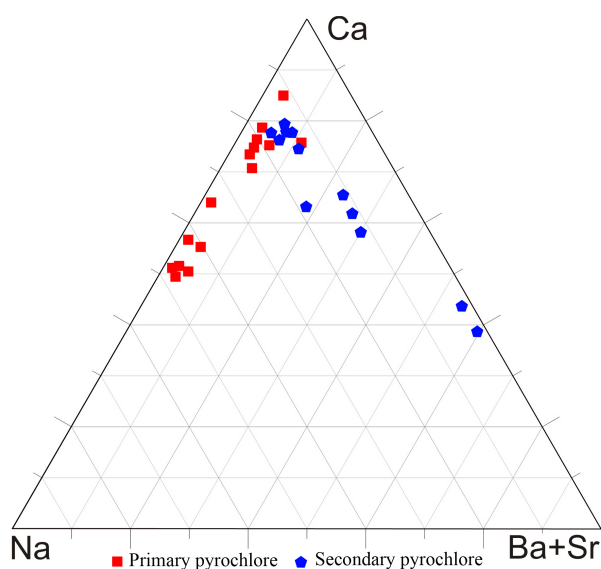


Fig. 1: Distribution of chemical analyses of primary and secondary pyrochlore in the diagram Na-Ca-(Ba+Sr) (a.p.f.u.)

REE minerals are also very common as small crystals and are produced as late replacements of the primary mineral associations, filling porosity in close association with barite. They consist of fluorocarbonates (bastnäsite-(Ce), parisite-(Ce), synchisite-(Ce)) and silicates (britholite-(La), cerite, tritomite-(Ce)).