Lofdal Farm area near the town of Khorixas in Damaraland, Namibia. Most of the carbonatite dykes range in width from 0.5 cm to 5 m but can reach widths of 25 m and extend over several kilometres. Carbonatite also occurs in plugs with diameters up to several hundred meters, although these bodies appear to lack elevated REE and REE ratios. The carbonatite dykes and plugs occur in association with syenite and nepheline syenite intrusions that combined form an alkaline intrusive complex in an area of over 125 km², of which Etruscan Resources Inc. has prospected 25 km². The complex is hosted by 1.7 Ga metasedimentary rocks, including gneiss and schist, called the Huab Basement Complex.

For this study, Etruscan Resources Inc. provided 18 carbonatite samples, representing 6 of the dykes and 2 of the plugs, as well as the host rocks. Etruscan Resources Inc. also provided a database of REE and some other trace element data for 1400 samples from the dykes and plugs. The objectives of this study are: (i) to determine the petrological and chemical characteristics of the suite of carbonatite samples, including a comparison of the dykes and plugs; (ii) to use the geochemical database to investigate chemical trends and spatial variations in rare-earth elements in the study area; and (iii) to try to gain a better understanding of the origin of this carbonatite suite. Previous work is limited but SEM/BSE analyses of four of the dykes showed a varying abundance of two REE minerals, bastnäsite ($(Ce, La)(Co_3)F$) and sychysite ($(Ca, Ce(CO_3)2F)$. The abundance of these two minerals varied from minor to ~20–25%. Besides these two REE minerals, the REE-bearing silicate mineral allanite was observed in one of the samples. As expected in carbonatite, minerals such as apatite, fluorite and calcite are abundant in the samples. Xenotime, an accessory mineral containing yttrium, also was identified in previous studies. This mineral had overgrown and/or replaced zircon in the carbonatite that had been used by previous researchers to determine the approximate age of the dykes (~765 ± 15 Ma).

A petrological study of carbonatite intrusions from the Lofdal Farm area, Namibia

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[Poster]

Unusually high total REE and high ratios of HREE to LREE ratios have been discovered in a carbonatite dyke swarm in the

Atlantic Geology, 2009, Volume 45, Number 1