

syms = 08756JS

Trace element characteristics of the lamprophyric dykes from the north coast of São Paulo State, Brazil

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The occurrence of lamprophyres among dykes of basaltic composition along the São Paulo coast was pointed out by DAMASCENO (1966). They crop out not only on the coastline between the cities of São Sebastião and Ubatuba, but also on São Sebastião, Mar Virado, and Anchieta Islands. They can be distinguished from the basaltic dykes by means of their microphenocryst contents (olivine, pyroxene and sometimes biotite), which give distinctive colours and textures to the rocks.

In the alkalis x silica (TAS-) diagram (LE MAITRE, 1989), these rocks plot in the tephrite-basanite, picrobasalt and foidite fields, whereas the basaltic dykes fall in the basalt, trachybasalt and basaltic trachyandesite fields and exhibit geochemical signatures like those of the high-TiO₂ basaltic dykes studied by COMIN-CHIARAMONTI et al. (1983) and MONTES-LAUAR et al. (1990).

Multielement diagrams using trace-element data normalized according to primitive mantle values (SUN & McDONOUGH, 1989) can better characterize the geochemistry of the lamprophyres. Broadly speaking, the trends are parallel. The rocks that fall in the picrobasaltic field are the least enriched, followed by those of the foidite and tephrite/basanite fields. The most incompatible elements (Cs, Rb, Ba, and K) are present in varying concentrations, modifying the shape of the individual diagrams. Compared to the lamprophyres, the basaltic dykes are more enriched in trace elements. Three of the studied samples present particular multielement patterns, very similar to ROCK's (1991) alnöites. In fact, one of these samples is a melilite-bearing rock (GARDA et al., 1994).

The trace-element behaviour of the samples of this study does not necessarily imply that all these rocks are genetically correlated. While the basaltic dykes show affinities with the high-TiO₂ basalts of the Paraná Basin, the lamprophyric dykes are more likely to be correlated with the alkaline (carbonatitic?) volcanism of the border of the Paraná Basin (ALMEIDA, 1986). The relative age of the dykes is still a matter of debate.

ACKNOWLEDGMENTS - G. Garda would like to thank Drs. Ian Campell and William F. McDonogh of the Australian National University for the ICP-MS analyses and discussions of the results, and CAPES (PDEE proc. 1798/93) for financial support in Australia.

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