

SIGNIFICANCE OF ALUMINIUM, CALCIUM, CHROMIUM, ZIRCONIUM, NIOBIUM AND IRON CONCENTRATIONS IN RUTILE FROM HIGH PRESSURE ROCKS

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Natural rutile from medium to high pressure and temperature rocks is an ubiquitous minor mineral phase. Electron microprobe analyses have been made on rutiles from different eclogitic parageneses and also from granulites and amphibolites.

Beam current was set at 50 nA at 15 kV and a PAP correction procedure was applied to the raw intensities. Count times were 100 s (Ca, Cr), 120 s (Al) and 150 s (Zr, Nb, Fe).

Trace element contents range from 30 - 2500 ppm (Al), 30 - 3000 ppm (Ca), 250 - 4000 ppm (Cr), 180 - 7500 ppm (Zr), 200 - 3400 ppm (Nb) and 170 - 10000 ppm (Fe). Variations in concentrations appear to depend on pressure, temperature and whole rock chemistry.

Fig.1 and 2 are diagrams of Cr and Al respectively against temperature. Both Cr and Al appear to increase with temperature whereas Ca (Fig.3) appears to decrease with temperature.

In diagrams of element against element e.g. Zr against Al (Fig. 4) samples from different localities can be distinguished very clearly.

Pressures and temperatures are inferred from literature data which are based on geothermobarometers and circumstantial geological arguments.

For samples from these localities different p,T conditions of origin are inferred and trace element contents in rutile may be the basis for functioning geothermobarometers for eclogites.

Sobolev et al. (1972) were the first to suggest that the Al content of rutile could be an indicator for pressure and/or temperature and our extended data base may provide a better foundation for this and further elements to design experiments aimed at calibrating on eclogite barometer.

Ref.:

N. Sobolev, J. G. Lavrent'ev & L. W. Usowa (1972), *Geologiya i Geofizika*, 11, (108 - 112)

□	S305	granulite	(Matsoku, Lesotho)
×	S308	eclogit	(Matsoku, Lesotho)
○	Mg1	amphibolite	(Münchb. Gneism., Germany)
◇	U30	eclogite	(Moldefjord, Norway)
★	Sk1	eclogite	(Steiermark, Austria)
★	1	eclogite	(Alpe Arami, Switzerland)
△	BD1934	eclogite	(Vissuri, Tanzania)
*	S470	eclogite	(Roberts Victor Mine, South Africa)

