BULK AND MINERAL CHEMISTRY OF THE OLIVINE LEUCITITE FROM JUANA VAZ, SACRAMENTO, MINAS GERAIS, BRAZIL.

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The olivine leucitite from Juana Vaz, Sacramento, Minas Gerais State, Brazil, is the first occurence of leucitite bearing volcanic rock recognized in continental Brazil (Murta, 1965, 1966; Guimarães, 1966). The occurence was discovered during a prospection program for bentonitic clay. It is located 40 km southeastern of the town of Sacramento, at the border of a plateau named "Chapadão dos Bugres."

The rock occur on a deep clayey soil (up to 60 meters) originated by weathering of tuffs and pyroclastic breccias of the Mata da Corda Formation. The rock occurence may represent a lava flow unit situated at the base of pyroclastic rocks.

The olivine leucitite is black, aphanitic, and presents a micro-prophiritic texture. It is essentially composed by olivine (33% in volume), leucite (20,4%), diopside (24,1%), phlogopite (7,0%), magnetite + ilmenite (9,7%), perowskite (1,7%), apatite (1,0%), and interstitial glass (3,1%).

Diopside forms prismatic crystal arranged around sub-circulars crystals of leucite (0.2 mm), which shows multiple complex twins. Ilmenite, magnetite and perowskite have tendence to form skeletal crystals (0,1 - 0,05 mm). The interstitial glass is brown in collor and have aciculars inclusions (apatite?).

The crystallization order is: olivine, leucite, diopside, apatite + oxydes + perowskite, phlogopite, and glass. This is in agreement with the sequence of crystalization experimentally obtained by Foley, (1985) to perpotassic liquids (lamproitic) on low fO2 condition (MW buffer).

Olivine xenocrystal are zoned with Mg richer cores (Mg/Mg+Fe=0,90) than borders (0,86). Euhedral and corroded phenocrysts present very constant Mg/Mg+Fe ratios (0,86), and relatively high values of CaO (0,4 to 0,6 wt%). Clinopyroxenes have very constant Mg:Fe:Ca ratios corresponding to diopside with Mg/Mg+Fe = 0.89. Characteristicaly they are Si and Al deficient, needing Fe=3 to complete the tetrahedric positions. The TiO2 content (2,3 to 2,6 wt%) is distinct from diopsides from others ultrapotassic rocks (0,7 to 2,4 wt%) (Barton, 1979; Mitchel, 1985). Their Al and Na contents are closer to clinopyroxenes from the Leucite Hills rocks than the Toro Ankole diopsides. Leucite has a compositon very similar to the ideal formula, except by a little deficience in silicium (0,03 cation/unit), that is compensated by the entry of Fe+3 in tetrahedric site. Contrary to leucites from Toro Ankole, they are very poor in sodium, i.e. whithout kalsilite exsolutions. Phlogopites have high contents in BaO (2,3 to 3,4 wt%;) and present Si and Al deficiency (0,55 to 0,48 atoms per formula unit). They have compositions similar to the kamafugitic phlogopites and are very distinct from the lamproitic and kimberlitic phlogopites (Mitchell, 1985). In a MgTiO3, FeTiO3, and Fe2O3 plot, the ilmenites fall in the kimberlitic field and present MgO values (8,5wt%), higher than the lamproitic ones. Apatites are fluor, Ba, and REE bearing, and present a P+4 deficience, due probably to a substitution of the type: Ca+P = REE + Si. Perowskite shows high contents of BaO(2,7 - 4,0wt%), La, Nd,

and Sm oxydes (2,5wt%), and carry 0,9 wt% of Na2O. The brown interstitial glass is very poor in SiO2, Na, and K (leucite depleted), rich in Al and probably H2O. Fe, Mg and Ti are relatively concentrated in it. A CIPW norm composition results in olivine, hyperstene, ortoclase, anorthite and corindon.
This leucitite is an ultrabasic (SiO2 - 40wt%), perpotassic (K2O/Na2O > 2,5), sub-aluminous rock, with MgO/MgO+FeO (moleculas proportion) of 75. It presents simultaneously high concentration in transitions elements (Ti, Ni, Cr, Co) and in LIL elements (K, Rb, Ba, Sr, Nb, Zr). These features, common to others kamafugitic rocks, are characteristic of primary liquids, probably derived from low grade partial fusion of an enriched peridotitic mantle with phlogopite and K-richterite, (Foley et al., 1987). In view of the above features and due to the abundance of olivine leucitites in the volcanic pile of the Mata da Corda Formation (Seer and Moraes, 1988), this rock can represent one of the primary magmas that originated the volkanic alkaline Alto Paranaiba Province.

Rock chemistry (1 and 2), CIPW norm and interstitial glass composition (3)

Oxides	1	2	3	1ppm		1	2
SiO2	40.89	39.37	37.25	Sc - 17.1	or	7.4	-
TiO2	4.06	4.20	2.90	V - 208	an	-	3.5
Al2O3	4.56	5.36	11.50	Cr -1366	le	6.9	12.5
FeOT	12.69	12.38	10.58	Co - 69	ne	4.4	3.2
MnO	0.16	0.37	0.07	Ni -1034	di	19.4	11.9
MgO	22.23	25.70	20.27	Pb - 8.7	hd	5.2	2.7
CaO	7.01	6.55	0.76	Th - 9.4	fo	32.5	41.0
BaO	0.12	-	-	Ga - 12.2	fa	10.9	11.6
SrO	0.12	-	-	Sr - 944	cs	-	2.2
Na2O	1.01	0.71	0.19	Ba -1481	il	7.7	8.0
K2O	2.74	2.70	2.45	Rb - 167	ap	1.7	1.3
P2O5	0.70	0.56	-	Nb - 77	DI	18.7	15.7
LOI	1.93	2.10	13.8*	Zr - 384			
TOT	98.22	98.00	100.00	Ce - 97			
				Y - 17.2			
				Yb - 2.55			
				La - 88			

(2) after Murta, 1986. * Calculated by difference.

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