SULFATE-BEARING FLUIDS IN EMERALDS FROM THE COQUI OCCURRENCE, CEARA STATE, NE BRAZIL.

A. Cheilletz (a), R.M. Castelo Branco (b), G. Giuliani (a,c) and J. Dubessy (d).
(a) CRPG-ENSG BP 20, 54501 Vandoeuvre, France.
(b) Dpt. Geologia, Universidade Fed. do Ceara, Brazil.
(c) ORSTOM, Universidade de Brasilia, Brazil.
(d) CREGU, BP 23, 54501 Vandoeuvre, France.

The emerald occurrences of Coqui, Ceara State, NE Brazil, (1) are spacially associated with lenses of pegmatites (age 0.5-0.7 Ga) characterized by regional colombo-tantalite and cassiterite mineralizations. Emerald crystals grow within wall-rock metasomatised zones developed around the pegmatitic bodies. Lepidoblastic assemblages of phlogopite (Fe/Mg=0.24-0.33; Al VI=0.49-0.69), quartz, plagioclase (An=20-35) and apatite characterize these metasomatic zones. The genesis of the Coqui emerald mineralization is similar to the other described emerald deposits of Brazil (2): it can be attributed to an infiltrational metasomatic process related to highly differenciated intruding granites and pegmatites provoking a K-metasomatism of the basic-ultrabasic wall-rocks metamorphic series.

The Coqui emerald crystals are characterized by low Cr (250 ppm) and relatively high Na_2O (0.54-0.62 %) contents. Paleo-fluid formation studies were performed on primary cylindrical elongated inclusions developped along the c-axis of the crystals as well as on primary and secondary quadratic-section shape cavities.

Thermo-optic, Raman-probe and SEM experiments reveal extremely complex and high salinity fluids. Teutec.= -45°C to -36°C, Tfg= -3.7°C to -2.7°C and Tfclath.= -4.2°C to +3°C. Bulk homogeneisation of the liquid-vapor phases occurs at 235°C-300°C in liquid phase. No halite crystal has been found. The vapour bubbles (20 vol% of the cavity) contains CO_2-N_2 mixture (molar prop. CO_2/N_2= 2.3-0.43) without CH4 or H2S. Direct Raman probing on the liquid phase and on hydrates formed during cryometric runs show the presence of $SO4^{2-}$ (0.01-0.1 molal). Solid phases determined by Raman microprobe in unopened inclusions are quartz, siderite, calcite, muscovite, albite and an isotropic Raman

inactive solid, presumably sylvite. Therefore, additional disolved