ESRF	**Experiment title: HP powder diffraction study of natural omphacites.**	**Experiment number**: CH-712
Beamline: ID9	**Date of experiment**: from: 17.11.1999 to: 20.11.1999	**Date of report**: 23.05.00
Shifts: 12	**Local contact(s)**: M HANFLAND	*Received at ESRF:*

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Report:

Synchrotron X-ray power diffraction experiments at high pressure conditions, from ambient to 13 GPa for a total of 18 points, were performed on the ID9 beamline (λ=0.4532 Å), to investigate the bulk elastic properties of natural *P2/n* omphacites, with quasi-ideal composition, i.e. $(Ca_{0.5}Na_{0.5})(Mg_{0.5}Al_{0.5})Si_2O_6$.

The monoclinic cell parameters *a*, *b*, *c* [Figure 1] and β were determined as a function of pressure, and their compressibility coefficients are 0.00277(7), 0.00313(8), 0.00292(5) and 0.00116(4) GPa^{-1} , respectively. The third order Birch-Murnaghan equation of state (Birch, 1986) was used to interpolate the experimental P-V data, obtaining K_0 = 116.6(±2.5) GPa and K'_0 = 6.03(±0.60). K_0 was also determinated by means of the axial and angular compressibilities [122.5(±1.7) GPa], and of the finite lagrangian strain theory [121.5(±1.0) GPa] (Catti, 1985). Discrepancies on K_0 are observed with earlier measurements by McCormick et al (1989) on vacancy bearing omphacites, richer than ours of aluminum (K_0=129 and K_0=139 GPa from the quoted authors). Accepted by Physics and Chemistry of Minerals as ‘’Synchrotron X-ray powder diffraction study of natural P2/n-omphacites at HP conditions’’ from Pavese, Diella, Levy, Hanfland.

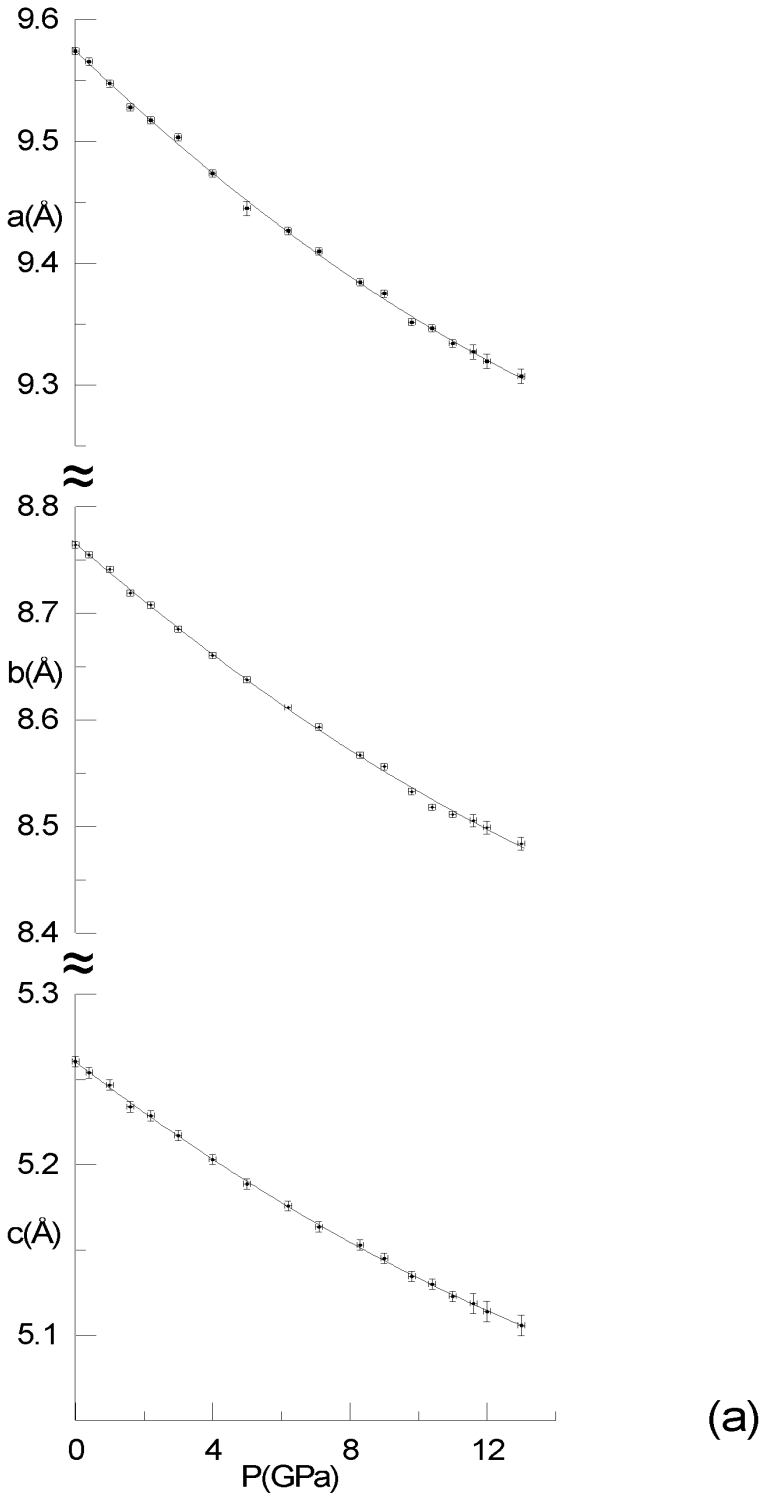

Figure 1

References

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