GLASS INCLUSIONS IN ALLENDE (CV3) OLIVINE: HEATING EXPERIMENTS.

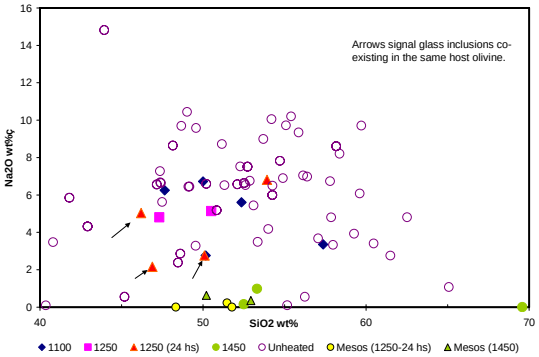
Varela, M. E.[1], Clocchiatti R.[2] and Kurat G.[3] [1]Complejo Astronómico El Leoncito (CASLEO), Av. España 1512 sur, J5402DSP, San Juan, Argentina, evarela@casleo.gov.ar; [2]Laboratoire Pierre Süe, CEA, CNRS, CEN Saclay, F- 91191 France, [3]Department of Lithospheric Sciences, University of Vienna, Althanstrasse 14, 1090 Vienna, Austria.

Introduction: Glass inclusions represent small volumes of liquids enclosed by a host mineral during its growth. Heating experiments on glass inclusions allow reversing the post-entrapment processes that occurred inside the inclusions during cooling. These experiments - performed on glassy and glass-bearing inclusions in olivine - enable us to obtain information regarding the conditions prevailing during host formation, either in terrestrial or extra-terrestrial rocks [e.g., 1 – 5]. Here we report on the heating experiments performed with glass inclusions in olivine of the CV3 Allende chondrite.

Methods and Results

Heating experiments were performed in a Pt-Pt90Rh10 heating stage at 1 bar pressure in a hot He atmosphere as oxygen getter [6]. The oxygen fugacity is estimated to have been between 10^{-9} and 10^{-10} atm at 1200 °C corresponding, approximately, to the equilibrium of a mixture of Ar-H_2 (1 % H_2). Quenching times were less than 1 s. The system was calibrated at the melting point of Au (1063 °C). Runs were performed with a gradual increase rate of temperatures until the final temperature of 1100 °C, 1250 °C and 1450 °C, respectively. The final temperatures were held during two hours (with exception of a second run at 1250 °C which was held during 24 h) after which a rapid quench (less than 1 s to about 500 °C) preserved the final conditions.

The major variations observed in the chemical composition of the heated glass inclusions is an increase of the FeO and MgO contents, with values up to 9 wt% and 19.4 wt%, respectively, as compared with the unheated glasses due to dissolution of the host olivine in the melt. However, glasses seem not to have reached equilibrium with their host showing Kd(Fe/Mg) (olivine/liquid) values ranging from 0.14 to 0.4. Interesting is the content of Na_2O in the heated glass inclusions that covers the same range as those in the unheated glasses, with exception of two glass inclusions that were heated to a final temperature of 1450 °C and the glass from the mesostasis (Fig.), which apparently lost Na at that high T.



References: [1] Sobolev et al. (1976) Akad. Nauk. S.S.S.R., *Siberian branch Geol. I Geofiz.*, no 5, 146-149;[2] Clocchiatti R. and Massare D.(1985) *Contribution to. Mineralogy and Petrology*. **89**, 193-204; [3] Fuchs et al., (1973) *Smithsonian. Contribution to Earth Science*. **10**, 38 pp.; [4] Sobolev A (1996) *Petrology*, 4, 228-239; [5] Varela et al., (2000) *Meteoritics and Planetary Science* 35, 3-52; [6] Zapunny et al., (1989) *Geochemica International*. **26**, 120-128. .