A DETAIL PETROGRAPHIC OF TWO CO3 CHONDRITES FROM THE ATACAMA DESERT, CHILE

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Introduction: Two carbonaceous chondrites CO3 type found in the Atacama Desert are presented here: El Médano 389 and El Médano 397, part of the collection of Museo del Meteorito. The study is concentrated in the characterization of Melt Inclusions Assemblages (MIAs) found mainly in olivine crystals present in chondrules. To better understand the composition of solid and volatiles trapped before the closure of the system. In order to constraint solar nebula compositions and different processes [1]. Raman spectroscopy is a non-destructive technique that allows identifying the position shift of specific bands in minerals and characterized temperature-pressure changes [2]. Samples with possible content of volatiles or those that presented "bubble" were selected to be analyzed by Raman Spectroscopy. Furthemore, we determine the geochemical compositions obtained by Laser Ablation ICPMS in each samples to known the relationship between trace element microdistribution in chondrules and mesostasis and chondrule-forming processes.

Techniques: Samples where studied in polished thin sections for optical microscopy and doble polished chips for melt inclusion assemblages at Universidad de Chile. The analyses included LA-ICPMS (major, minor and trace elements) and Raman spectroscopy at Virginia Tech. Finally, powders were analyzed with IR spectroscopy at Cosmic Dust lab Universidad Diego Portales.

Preliminary results: A detail petrographic evidence shows three types of melt inclusions assemblages (MIAs) and were identified in the three samples: MIA1 – consisting in pure glass, MIA2 – monocrystal, consisting in glass plus a single mineral grain and MIA3 – multiphase, consisting in glass plus a variety of minerals. The melt inclusions recognized until now are grouped from 2 to 7 MIAs, which sized ranging between 16 and 60 µm. Lastly, the MIAs doest show a particular distribution in the olivine crystal.

It will be presented the first results from Raman, IR and the geochemical compositions obtained by Laser Ablation ICPMS in each sample, as well as all the petrographic constraints for each meteorite.

References: [1] Varela M.E. et al. (2005). Icarus 178 , Issue 2, 553-569. [2] M. L. Frezzotti, F. Tecce., & A. Casagli. Journal of Geochemical Exploration, 2012, 112, p. 1-20.

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