**DETAILED MICRO-RAMAN AND TEXTURAL ANALYSIS OF A LARGE CAI FROM THE NWA 2086 CV3 CARBONACEOUS CHONDRITE.**

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**Introduction:** Ca-Al-rich inclusions (CAI's) are amongst the oldest solid materials of the Solar System [1, 2]. They not only can provide information about conditions of the solar nebula but can be a significant indicator of hydrous alterations occurred in the parent body of meteorites. NWA-2086 CV3 chondrite is famous about that it contains the largest CAIs have been observed in CV3 type carbonaceous chondrites [3]. In this study a large spinel rich CAI of the NWA 2086 meteorite will be investigated by detailed micro Raman mapping technique in order to reveal the nature and circumstances of fluid assisted alteration affected the meteorite before infall.

**Results:** Pirimary mineral assemblage of the spinel rich CAI is the following: spinel+hibonite+perovskite±melilite. Hibonite can be found as tabular crystals as intergrown with spinel and only occur in the border of the matrix and the inclusion. Spinel occurs as small anhedral grains generally in the CAI and containing tiny euhedral perovskite inclusions. Melilite (gehlenitic composition) occur very rarely as tiny grains.

Secondary mineral assemblage is containing: di+hed+grs±adr+dmi+an+nph+sdl. These minerals exhibit characterisitc textural ordering in the CAI. Grossular+andradite and anorthite+dmisteinbergite assemblages can be found as fine grained crust around spinel and spinel+hibonite grains, and they are forming a thick band on the rim of the CAI. Diopside occur as thin rim coating the grs+adr and an+dmi crust around spinel and spinel-hibonite grains. Hedenbergite can be found as euhedral crystals growing into the pore space among sp±hib+grs+adr+an+dmi+di grain associations. Nepheline is only observable in the core of the CAI and sodalite occur on the rim of the nepheline rich regions. Nepheline exhibit a bulky or tabular habit appearance while sodalite show fibrous and lamellar textural features.

**Discussion and conclusions:** The amount, localization, textural habit and morphology of the primary and secondary mineral assemblages of the CAI indicate a metasomatic alteration of an originally melilite containing spinel rich CAI. The possible main alteration processes could be the decomposition and alteration of gehlenitic melilite into nepheline+sodalite and diopside and hedenbergite by a fluid provided significant amount of sodium, chlorine, iron, magnesia and silica. The alteration mineral paragenesis could be a result of a pervasive Fe-alkali-halogen metasomatism which can be observed very frequently in case of many CV3 type carbonaceous chondrite [4].

**References:** [1] Ireland T. R. and Fegley B., Jr. 2000. *Int. Geol. Rev.* 42, 865–894. [2] MacPherson, G. J. 2003. Davis A. M. (ed) *Meteorites, comets, and planets vol 1*. Elsevier-Pergamon, Oxford, 201–241. [3] http://www.meteorite-times.com/Back_Links/2008/march/Accretion_Desk.htm
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