



Hydrothermal activity on the CV parent body: new perspectives from the unique CV-like MM5.29 micrometeorite

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The micrometeorite MM5.29 ($\sim 200 \mu\text{m} \times 600 \mu\text{m}$) was recovered from Frontier Mountain ($72^{\circ}59'S-160^{\circ}20'E$) by the Programma Nazionale delle Ricerche in Antartide (PNRA) [1]. This sample shows clear features related to the CV chondrites and displays signs of extensive thermal metamorphism in presence of fluids. Raman, FE-SEM-EDS, EBSD, μXRD and EMPA analysis reveal that the sample has platy orientated Fe-rich olivine matrix with ubiquitous andradite crystals surrounded by diopside and jarosite. Only two other samples have been recognized as CV-like micrometeorite ([2], [3]) among many others with a carbonaceous-like composition (e.g [4]). Furthermore we acquired NIR and MIR spectra (from $2 \mu\text{m}$ to $15 \mu\text{m}$) of the MM5.29 with μIR Hyperion 2000 Vertex Bruker with a spot of $150 \times 150 \mu\text{m}$. In particular the sample shows NIR spectra with bands at $2.7 \mu\text{m}$, $3.1 \mu\text{m}$ and $\sim 3.4 \mu\text{m}$, which is comparable to the average NIR spectra of Ceres [5]. With this study we are expanding the knowledge in the micrometeorites compositional range with the first unambiguous CV-like micrometeorite and in the thermal metamorphism and hydrothermal events that took place on the CV parent body(-ies). In addition, considered that micrometeorites come from the asteroid belt [6] and cometary sources [7-8-9], the study of this sample gives important knowledge in support of space mission with C type asteroids and comets as a target (e.g. NASA-Dawn, Hayabusa 2, Osiris-Rex, Rosetta) giving possible insights into their composition and geological evolution.

[1] Folco et al., 2008. *Geology*. [2] Genge et al., 2010. *MetSoc*. [3] Van Ginneken et al., 2012. *Met. & Planet. Sci.* [4] Cordier et al., 2018. *Geochim. Cosmochim. Acta*. [5] De Sanctis et al., 2015. *Nature*. [6] Carrillo-Sánchez et al., 2015. *Geophys. Res. Lett.* [7] Dobrică et al., 2012. *Geochim. Cosmochim. Acta*. [8] Imae 2012. *Proc. Internat. Astron. Union*. [9] Noguchi et al., 2015. *Earth & Planet. Sci. Lett.*