

MINERALOGICAL CHARACTERIZATION OF THE FUSION CRUST OF THE CAVEZZO L5 ANOMALOUS CHONDRITE. M. Rondinelli¹, D. Gardiol², G. Pratesi³, A. Di Michele⁴, A. Fabbrizio⁵, M. Bellesi¹, G. Giuli¹, ¹Università di Camerino, sez. Geologia, Via Gentile III da Varano 7, 62032 Camerino (MC), I marianglo.rondinelli@studenti.unicam.it; ²OATO, Via dell'osservatorio 20, 10025 Pino Torinese (TO), I; ³Università di Firenze, MEMA, Via G. Capponi 3R, 50121 Firenze, I; ⁴Dipartimento di Fisica e Geologia, Università di Perugia, Via Pascoli, 06123 Perugia, I; ⁵Charles University, Institute of Petrology & Structural Geology, Albertov 2038, 128 00 Nové Město Prague, Czech Republic

Introduction: On January 1st at 18:26:53 UT, eight stations of the PRISMA network detected a brilliant fireball, named IT20200101, in the skies of northern Italy [1]. Thanks to the involvement of local people by an effective media campaign, two fragments were recovered, weighing 3.12 g (specimen 1) and 52.19 g (specimen 2), three days after the bolide was observed. In this contribution we describe the mineralogical characterization of the fusion crust of samples 1 and 2.

Methodologies: The fusion crust of both sample 1 and sample 2 have been analysed by optical microscopy and FE Scanning electron microscopy in order to get accurate microchemical information on the mineralogical phases present in the fusion crust. Moreover, microraman spectroscopy is currently being used in order to further characterise the phases present in the crust.

Conclusions: Both Optical observations and micro-chemical analyses of the meteorite interior were consistent with published classification as a L5 ordinary chondrite [2]. The fusion crust display a complex texture of skeletal and acicular olivine, often with a rim richer in Fe than the core. The small size of most olivine crystal prevented to obtain an accurate composition for most of them. Magnetite dendrites are commonly associated to the olivines. Minor minerals found in the crust include euhedral chromites, ilmenites, plagioclases in aggregates with chromites (Pl-chr assemblages) and a nickel sulphide whose composition is close to Ni₂S. One of the two Ni sulphides found display submicroscopic inclusions of metallic Ni.

The chromite grains analysed in the crust generally display a much higher Mg# than the chromites in the bulk, compatibly with previous results from a Phd thesis by Bellesi [3]

To our knowledge, Ni₂S has never been reported before in chondritic material; thus, in order to confirm the composition and in order to determine the structure of this phase, we are planning to cut a slice of one of these grains by FIB and to study this phase by Transmission Electron Microscopy.

References: [1] Gardiol D. et al., Cavezzo, The first Italian meteorite recovered by the PRISMA fireball net-work. Orbit, trajectory and strewn-field.,

(2020), Monthly Notices of the Royal Astronomical Society, 501(1), 1215-1227.

[2] Pratesi G., Moggi Cecchi V., Greenwood C. R., Franchi I.A., Hammond S.J., Di Martino M., Barghini D., Taricco C., Carbognani A., Gardiol D., Cavezzo- The double face of a meteorite: Mineralogy, petrography., (2021), Meteoritics & Planetary Science, 56(6), 1-26

[3] Bellesi M., Chromites in ordinary chondrite fusion crusts, PhD thesis, 2021