SI ISOTOPIC COMPOSITION OF EFREMOVKA E101.1 CAI

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Inclusion E101.1 from the CV3 carbonaceous chondrite Efremovka is a compact type A CAI, highly enriched in ultra-refractory oxides [1]. This inclusion consists of several different lithological sub-units with a complex petrography. The core contains ultra-refractory fassaitic clinopyroxene, enriched in Sc and Zr, enclosed in large melilite crystals [1]. This core also contains some impact glass [1,2]. Surrounding the inclusion is a well-defined Wark-Lowering rim (WLR). This inclusion has been extensively studied for O [2] and Mg isotopes [3].

Here, we investigate the Si isotopic composition of the different sub-units of this inclusion. Our goals are to better understand the conditions of formation of the CAI and the relationship between the different lithological units. We performed Si isotope analyses using the Cameca ims 1270 at UCLA in multicollection mode. San Carlos olivine, pyroxene and melilite reference materials were used to correct for instrumental mass fractionation. The reproducibility obtained on these reference materials is better than 0.4 ‰ at one sigma.

One profile of 200 μm from the rim to the core of the inclusion was performed. Melilite close to the WLR is fairly homogeneous, around – 4.8 ‰ ±1.6 ‰, in contrast to the melilite from the center of the core. Only two analyses were performed on the center of the core and we will perform more analyses to investigate this discrepancy. The impact glass is isotopically lighter than the melilite with a mean value of -7.7 ‰. The WR is more fractionated than the core of the inclusion with values between + 7.3 ‰ to+ 14.7 ‰.

No correlation is apparent between Mg and Si isotopic compositions in the few data that we have. As shown by the O [2] and the Mg [3] studies, this inclusion could have experienced some evaporation event. Further Si isotope analyses are currently ongoing to investigate in detail the relationship between the sub-units and the nature of the evaporation event(s) forming the inclusion rim.

References: [1] El Goresy et al. 2002. *Geochim. Cosmochim. Acta* **66**, 1459-1491. [2] Aléon et al. 2010. *Meteorit. Planet Sci.* **45**, A7. [3] Aléon et al. 2011, *this conference*.