**FINE-GRAINED REFRACTORY INCLUSIONS FROM THE REDUCED CV3 CHONDRITE THIEL MOUNTAINS 07007.**

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The Thiel Mountains (TIL) 07007 was found by the 2nd Korea Expeditions for Antarctic meteorites; it has been classified as CV3 chondrite based on the bulk oxygen isotopic composition ($\Delta^{17}O$ = -4.35‰) and petrological characteristics [1, 2].

A thin section of the meteorite (SNU-T068) having the area of ~266mm$^2$ was studied for Petrological characteristics with optical microscope, scanning electron microscope and electron microprobe analyzer. Oxygen isotopic compositions of individual mineral phases are being measured using the NanoSIMS 50 at Korea Basic Science Institute and the data will be presented at the meeting.

TIL 07007 consists of relatively large chondrules, fine-grained refractory inclusions, amoeboid olivine inclusions and fine-grained matrix. Chondrules are mostly metal- and sulfide-rich type I porphyritic olivine or porphyritic olivine pyroxene chondrules: type II chondrules are relatively rare. Average area occupied by a single chondrule in the thin section is ~0.75 mm$^2$, which is somewhat larger than that of Allende we measured (~0.50 mm$^2$). Possibly due to impact compaction, chondrules and inclusions are all elongated to the same direction. Numerous micro-faults also probably due to impact exist in chondrules, inclusions and matrix. Average major and minor axes of chondrules are 1.13 and 0.67 mm, respectively giving the average eccentricity of ~0.75 (aspect ratio of ~1.7). TIL 07007 has no magnetite, its sulfide grains are nearly Ni-free and modal matrix/chondrule ratio is 0.50; these characteristics are similar with the other reduced CV3 chondrites, especially with Efremovka and Leoville [3, 4].

Nineteen refractory inclusions larger than 80μm have been found in the thin section. Two of them are completely or partially surrounded by amoeboid olivine inclusions. Similar to chondrules, the inclusions are also elongated: one extreme is 2040x140 μm. All of them are fine-grained: no coarse-grained Ca-Al-rich inclusions of igneous texture are found. The mineral assemblage and texture of the fine-grained refractory inclusions are very similar to those in Leoville and Efremovka [4]. Mineralogy varies but typically is spinel, pyroxene (Al-diopside and Al-Ti diopside), anorthite and melilite as major minerals. Perovskite is also found in most of them. Three inclusions have minor or trace amount of forsterite. Hibonite is absent or rare. Some inclusions have a few Fe-Ni metal and sulfide grains. Secondary minerals are absent in most inclusions but found in two inclusions. Some inclusions show a zoned structure in mineralogy.

Seven inclusions are relatively spinel-rich and very similar to the fined-grained spinel-rich inclusions in Leoville and Efremovka [4]: two of the spinel-rich inclusions are melilite-free. Another seven inclusions are melilite-rich ($Ak_{0-20}$): melilite occupies most area of the inclusions and has fine-grained irregular shaped spinel±hibonite±perovskite and anorthite±diopside aggregates in it. The other three inclusions are rich in Al-diopside.

**References:** [1] Weisberg M. K. et al. 2010. *Meteoritics & Planetary Science* 45:1530-1551. [2] Choi B.-G. et al. 2009. *Journal of the Geological Society of Korea* 45:593-605. [3] Krot A. N. et al. 1995. *Meteoritics & Planetary Science* 30:748-775 [4] Krot A. N. et al. 2004. *Meteoritics & Planetary Science* 39:1517-1553.