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NWA-6693: An ungrouped achondrite

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NWA 6693 is an ungrouped meteorite with a typical igneous texture [1]. The sample has an oxygen-isotopic composition ($\Delta^{17}\text{O} = -1.08 \text{ ‰}$ and $\delta^{17}\text{O} = 1.19 \text{ ‰}$) [2] that plots in the field for acapulcoites and lodranities [3]. The modal composition of our sample based on reflectance microscopic studies is 70% pyroxene, 15% Olivine and 13% feldspar. Accessory phases are Cr-spinel, FeNi metal and FeNi sulfide. Preliminary semi-quantitative measurements on the elemental composition of the mineral phases have been performed using SEM. The whole sample shows a high amount of Ni, particular within metal phases. Olivine and the orthopyroxene are Fe-rich. The texture of the sample can be described as coarse-poikilitic with oikocrysts of clinopyroxene. Of special interest are small bubble-like tracks. Individual “bubbles” sometimes are composed of several mineral phases which might indicate fluid or melts as precursor material. The main phases trapped are Cr-spinel, FeNi metal (awaruite) and FeNi sulfide.

[1] Jambon, M. et al. (2012) 43rd LPSC, abst. #2099.

[2] Warren, P., H. et al. (2013) GCA 107, 135-154.

[3] Irving, A., J. et al. (2011) 74th MetSoc., abst. #5231

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