Aluminium-mg systematics of acapulcoite-lodranites.

Y. HIDAKA[1*], G. HUBLET[1] AND V. DEBAILLE[1]

[1]Laboratoire G-time, université Libre de Bruxelles, 50 Av. F. D. Roosevelt, Brussels, Belgium
([*]correspondence: yhidaka@ulb.ac.be)

Primitive achondrites like acapulcoite-lodranites are important materials to investigate the early differentiation processes of asteroids. Short-lived radionuclide chronometers are useful to understand the first few million years of the solar system history. In this study, we have performed internal and external isochrons for several acapulcoite and lodranite using the ^{26}Al-^{26}Mg system in order to unravel their geological history.

We have analyzed 3 acapulcoite and 1 lodranite meteorites (Dho125, Dho290, Y981505 and Y981725 respectively. We performed mineral separation on Dho290 and Y981725 by using isodynamic magnetic separator (Frantz, L-1) and could obtain Mg isotopic data from 3 separated fractions and one bulk rock for both of meteorites.

All bulk rock fragments have δ^{26}Mg* deficits (-0.0004 to -0.072) and subchondritic to chondritic ^{27}Al/^{24}Mg ratios, in agreement with a previous study [1]. The δ^{26}Mg* deficits of these acapulcoites and lodranite can be interpreted as the evidences of the early formation of this group of meteorites.

We obtained internal isochrons with $(^{26}Al/^{27}Al)_0$ of $(6.57\pm2.93)\times10^{-7}$ and $(1.05\pm1.68)\times10^{-5}$ for Y981725 and Dho290 respectively. While the error associated to Dho290 is large and still under investigation, Y981725 gives a formation age of 4.6±2.1 Ma. This is in agreement with a previous Hf-W study [2], hence confirming an ancient metamorphic/melting episode at the very beginning of the solar system on the acapulcoite/lodranite parent body. Those ages will be refined, bringing new insights into the early differentiation of asteroids.

[1] Larsen *et al*. (2011) *ApJ* **735**, L37. [2] Touboul *et al*. (2009) *EPSL* **284**, 168-178.