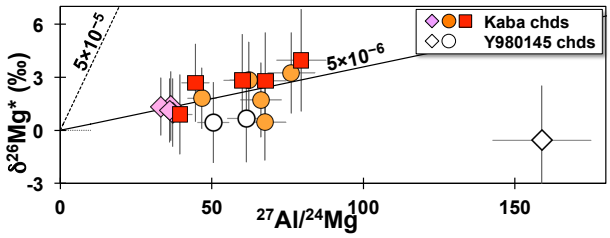
^{26}AL-^{26}MG SYSTEMATICS IN CHONDRULES FROM KABA AND YAMATO 980145 CV3 CHONDRITES

K. Nagashima[1], A. N. Krot[1], and M. Komatsu[2]. [1]HIGP/SOEST, University of Hawai'i at Mānoa, USA, [2]The Graduate University for Advanced Studies, Japan. E-mail: kazu@higp.hawaii.edu.

Introduction: Short-lived radionuclide ^{26}Al was likely the major heat source of planetesimals formed in the early Solar System. If ^{26}Al was uniformly distributed in the protoplanetary disk, the initial abundance of ^{26}Al in chondrules could constrain the accretion ages and thermal history of the chondrite parent bodies. Unlike chondrules from the least metamorphosed chondrites, chondrules from CV chondrites often show disturbed Al-Mg systematics [e.g., 1,2] and initial abundance of ^{26}Al in the CV parent body is not well known. Here we report preliminary results of Al-Mg systematics in chondrules from two of the least metamorphosed CV chondrites, Kaba and Y-980145 [3,4].

Results: Among chondrules in 2 sections of Kaba and 1 section of Y-980145, we found several chondrules that have clean, unaltered plagioclase grains with high Al/Mg ratios. Their plagioclase compositions are typically $An_{\sim 80-90}$. Al-Mg systematics of plagioclase in 3 and 2 type-I porphyritic chondrules from Kaba and Y-980145, respectively, were measured with the UH ims 1280 SIMS using the procedure described in [5]. As shown in a figure below, none of plagioclases in Y-980145 chondrules show resolvable excesses in δ^{26}Mg*. In contrast, most measurements in Kaba chondrules show elevated δ^{26}Mg* and about a half of them are resolvable from the terrestrial δ^{26}Mg. These excesses are generally correlated with their Al/Mg ratios, indicative of *in situ* decay of ^{26}Al. With the terrestrial δ^{26}Mg as an intercept, model isochrons for the 3 chondrules from Kaba correspond to initial ^{26}Al/^{27}Al ratios of $(4.4\pm2.1)\times10^{-6}$, $(4.8\pm3.7)\times10^{-6}$, and $(6.4\pm2.8)\times10^{-6}$. Assuming uniform distribution of ^{26}Al in the disk at the canonical level, $(^{26}Al/^{27}Al)_0 \sim 5.2\times10^{-5}$ [6], these Kaba chondrules formed ~2−2.5 Myr after CV CAIs [7]. These formation ages are comparable to or slightly older than the model accretion age of 2.4−2.6 Myr that is required for CV parent body to reach its peak metamorphic temperature of 600ºC [8]. The short time interval requires rapid accretion of chondrules into their parent body after their formation. No δ^{26}Mg* excesses in Y-980145 chondrules could be due to disturbance of Mg-isotopes in plagioclases due to thermal metamorphism [e.g., 9].



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