A NEW FUN CAI

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The strongest evidence for the presence of ^{26}Al ($\tau_{1/2}$ = 0.73 Ma) in the early Solar System comes from the study of CAIs. It is well established that most bulk CAIs plot on a ^{26}Al-^{26}Mg isochron with a slope corresponding to an initial Solar System $^{26}Al/^{27}Al$ of ~$5x10^{-5}$ and an initial $^{26}Mg/^{24}Mg$ ratio that is about 40 ppm lower than the average for the Earth value. Comparison of ^{26}Al-^{26}Mg, and ^{207}Pb-^{206}Pb systems seems to validate ^{26}Al as a chronometer and suggests that ^{26}Al was widely and uniformly distributed in the early Solar System and can be used as a fine-scale chronometer. However, there are some inclusions that are isotopically different from most other CAIs [1]. We have micro-drilled 8 CAI objects from Allende. Seven of them have REE patterns of Group I CAIs, while one is a Group II CAI. We measured ^{26}Al-^{26}Mg isotope systematics of these CAI objects with a Nu Plasma II MC-ICPMS. We determined $\delta^{25}Mg$ and $\delta^{26}Mg$ values relative to the DSM3 standard and then used the exponential law to correct for natural mass-dependent fractionation to obtain a precise estimate of $\varepsilon^{26}Mg$. Six Group I CAIs plot on the canonical CAI ^{26}Al-^{26}Mg isochron, while the Group II inclusion lies slightly below the isochron, suggesting either a disturbance or a low initial $^{26}Mg/^{24}Mg$. One CAI object with a negative $\varepsilon^{26}Mg$ = -3.77 ± 0.11 (2SE) and $\delta^{25}Mg$ = +3.85 ± 0.03 (2SE) fits the original definition of FUN inclusion. It has both a substantially negative initial $^{26}Mg/^{24}Mg$ ratio (at least ~350 ppm below the initial Solar System value) and a substantially fractionated $\delta^{25}Mg$-value. It is, however, not as extreme as the original FUN inclusions EK-4-1 or C1 [1].

[1] Wasserburg et al. (1977) *Geophys. Res. Lett. 4*, 299-302.