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Rare earth element (REE) systematics in Rumuruti (R) chondrite Ca,Al-rich inclusions.

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Ca,Al-rich inclusions (CAIs) are the oldest objects known in our solar system and thus bear valuable insights into early solar system processes. REE systematics of 45 CAIs from seven R chondrites described previously [1] were obtained applying LA-ICP-MS. REE abundances are mainly between ~ 5 and $\sim 40 \times \text{CI}$ (range: ~ 0.3 - $100 \times \text{CI}$). Patterns are similar to those established for Allende CAIs [2]. Most abundant are CAIs with Group II patterns (17), Group V patterns (9), and those with negative Eu anomalies (10). In contrast, CAIs with Group I (3), Group III (5), and Group VI (1) patterns are rather seldom. Ultrarefractory patterns are seemingly absent. No systematic relationship between inclusion type and the REE pattern was found. The REE patterns indicate different processes involved in R chondrite CAI formation and evolution, including fractional condensation, (in)complete condensation, and probably melting along with distillation to account for the volatile element loss.

[1] Rout, S.S. & Bischoff, A. (2008) MAPS 43, 1439-1464. [2] Mason, B. & Martin, P.M. (1977) Smiths. Contrib. Earth Sci. 19, 84-95.

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