GEOCHEMISTRY OF CHAINPUR CHONDRULES; EVIDENCE FOR EVAPORATION AND RECONDENSATION. G. Kurat, Naturhistorisches Museum, A-1014 Vienna, Austria, E. Pernicka, Ingrid Herrwerth, and A. El Goresy, Max-Planck-Institut für Kernphysik, P.O.B. 103980, Heidelberg, FRG.

Bulk and mineral chemical data were collected by INAA and electron microprobe on a suite of 10 chondrules from the Chainpur LL3 chondrite, which have been selected for $^{40}Ar/^{39}Ar$ age determination (1). On this set of data we made the following observations:

(a) As previously recognized (2) chondrules are on average depleted in siderophiles and consequently enriched in lithophiles.

(b) The lithophile component of some of our chondrules appears to be primitive and a relationship between different chondrule compositions can be established by a few simple processes. In Fig.1 the relationship of Na and K is shown. Three groups of chondrule silicate compositions can be distinguished: A primitive group forming a sequence of increasingly devolatilized chondrules: 1 (~ chondritic),8,2,3,4,9. Volatiles and moderately volatiles are strongly depleted in the most refractory chondrules by factors of 0.1 for K and 0.5 for Mn relative to chondritic composition. The second group consists of two chondrules (6 and 10), which are slightly enriched in Na but depleted in K. Chondrules 5 and 7 form the third group, which is enriched in the volatiles K and Na (1.9x and 1.1xCI respectively) and in Mn (1.3xCI). These different chondrule compositions can probably be related to each other by evaporation-recondensation processes, evidence of which has been reported a long time ago (3).

(c) Metal compositions in all chondrules are fractionated. They are depleted in Ir and Au to different extents (down to 0.1xCI for Ir). In order to account for the Chainpur bulk metal composition two additional types of metal (rich in Ir and Au) must be postulated, one of which has been identified recently (4). However, both were not sampled in our chondrule suite.

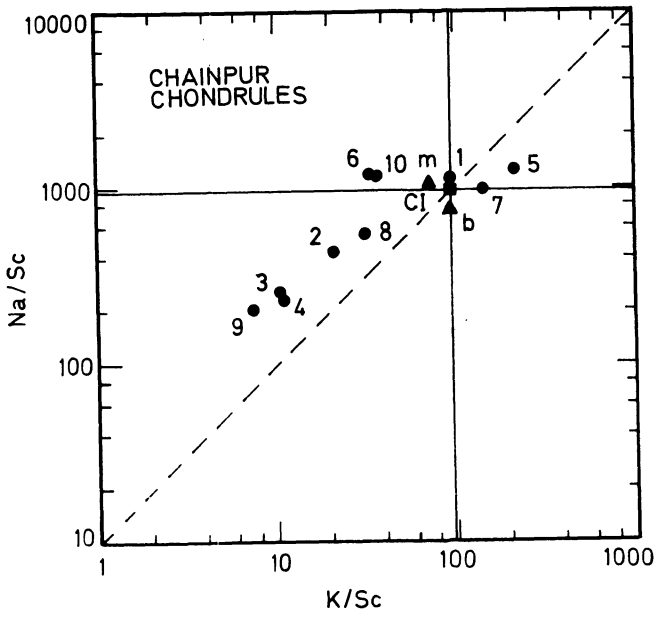

Fig.1: Na/Sc versus K/Sc in chondrules from Chainpur compared to CI, Chainpur matrix (m), and Chainpur bulk (b) (ref.4) compositions.

References

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