ORDINARY CHONDRITES: MORE THAN THREE GROUPS

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Ordinary chondrites (OCs), the most abundant meteorites within *falls* and *finds*, are categorized in three main groups (H, L, and LL) [1] based on differences in their chemical, isotopic, mineralogical and petrographic characteristics. Petrography and mineral chemistry (olivine and low-Ca pyroxene) data are the basis for the majority of OCs classifications in most laboratories. However, more detailed work can lead to recognition of rare or previously unknown types of meteorites. These samples broaden our knowledge about the diversity of materials in the Solar System and the physiochemical conditions in the solar nebula. Here, we report the presence of a new group and a new grouplet of OCs.

First, we suggest the recognition of chondrites intermediate between H and L as a separate OC group and propose the H^L designation to avoid confusion with the current H/L designation that design mostly meteorites for which not enough data are available to decide between H and L classification. Magnetic, textural, whole-rock and mineral chemistry, and oxygen isotopic composition studies on Famenin (H^L3 fall) suggests its close relationship with Tieschitz and Bremervörde, two other intermediate H^L3 chondrites. A number of OCs (such as LAP 031047, EM 195, SJ 041, and Cali) have the same intermediate characteristics. We suggest their origin from a different parent body than those of H and L chondrites [2,3], justifying the definition of a separate OC group.

EM 301 is an ungrouped OC with overall texture and trace-element distribution similar to those of OCs, but with silicate (olivine and low-Ca pyroxene) compositions that are more reduced than those in OCs, with average olivine and low-Ca pyroxene of $Fa_{3.9\pm0.3}$ and $Fs_{12.8\pm4.9}$, respectively. It shows similarities with the chondritic clasts in Cumberland Falls aubrite [4], and with NWA 7135 and Acfer 370 ungrouped chondrites. Based on mineralogy, whole-rock and oxygen isotopic composition, we suggest the existence of a new grouplet of OCs formed in more reduced conditions that known OC groups and their origin from a different parent body [5].

The existence of these two new groups/grouplet suggests that more variety and additional new groups/grouplets may lie among the vast numbers of unclassified OCs.

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