

### GROVE MOUNTAINS 020043: A POSSIBLE CHONDRITIC PRECURSOR OF ACAPULCOITES

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**Introduction:** Grove Mountains (GRV) 020043 is a typical chondrite, shares many petrographical characteristics with ordinary chondrites and initially classified as an H4 ordinary chondrite [1]. However, analysis of whole rock oxygen isotopic composition suggests that this meteorite is an ungrouped chondrite.

**Petrography and mineral chemistry:** The meteorite is a type 4 chondrite, with the same mineral assemblage with ordinary chondrites but Ca-poor pyroxene is more abundant than olivine. The shock stage and weathering degree are S3 and W3, respectively. Average fayalite content of olivine is 10.9 mol% (10.4-11.5 mol%). Ferrosilite content of Low-Ca pyroxene ranges in 9.9-11.3 mol%. The composition of diopside is also homogeneous and the average values of En, Fs and Wo are 49.3, 4.0 and 46.6 mol%, respectively. The composition of plagioclase is inhomogeneous. The values of Ab, Or and An are 78.9±3.8, 4.0±0.9 and 17.1±4.0 mol%, respectively.

**Whole rock oxygen isotopic composition:** Oxygen isotopes:  $\delta^{18}\text{O}=+3.27\%$ ,  $\delta^{17}\text{O}=+0.76\%$ , which are within the acapulcoites and lodranites field and also near the range of CR chondrites and K grouplet [2,3,4].

**Discussion and conclusions:** The oxygen isotopic composition of GRV 020043 definitely indicates it's not an ordinary chondrite. The petrographical characteristics of GRV 020043 is similar to those of ordinary chondrites indicate it neither a K member nor a CR carbonaceous chondrite. GRV 020043 does not fit into any established group, so it an ungrouped chondrite. Relative to ordinary chondrites, GRV 020043 has more magnesian mafic minerals, so it is more highly reduced and is richer in Low-Ca pyroxene relative to olivine. These are all the property of primitive achondrite acapulcoites and lodranites [5]. The most important is that the whole rock oxygen isotopic composition of GRV 020043 is in the range of acapulcoites and lodrites. The two groups are generally considered to have formed by metamorphism or incomplete melting of chondritic material [6,7,8]. Therefore, GRV 020043 may be a material from acapulcoite-lodranite parent body, it represents the precursor chondrite of acapulcoite-lodranite clan.

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