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AQUEOUS ALTERATION AND HEATING EVENTS OF ANOMALOUS CM CHONDRITES. M.A. Ivanova[1], M.A. Nazarov[1], L.A. Taylor[2], T.K. Mayeda[3], and R.N. Clayton[3]. [1]Vernadsky Institute of The Russian Academy of Sciences, 19 Kosygin St., Moscow 119991, Russia (venus2@online.ru), [2]Planetary Geosciences Institute, U. of Tennessee, Knoxville, TN 37996; [3]Enrico Fermi Institute, U. of Chicago, Chicago IL 60637, USA.

Introduction. Unusual carbonaceous chondrites from the desert of Oman, Dhofar 225 (Dh-225) and Dhofar 735 (Dh-735), have similarities to the Antarctic metamorphosed carbonaceous chondrites (MCC) B-7904 (CM), Y–82162 (CI), and Y-86720 (CM). Dh-225 and Dh-735's very different post-accretional histories – including aqueous alteration and heating events – have not affected their oxygen isotopic systematics.

Results. Texturally, Dh-225 [1] and Dh-735 are similar to CM-chondrites, but Dh-735 is a highly brecciated chondrite. They contain irregular olivine aggregates, chondrule-like objects, and refractory inclusions embedded in a fine-grained phyllosilicate matrix. The rounded objects are mantled with a dark, fine-grained, accretional-dust patina. Minor phases include FeNi metal, troilite, pentlandite, pyrrhotite, chromite, schreibersite, and Ca-carbonates. Among accessories, Dh-225 contains eskolaite Cr-barringerite, Dh-735 possesses Mg-ilmenite and rutile and contains abundant sulfides.

Olivines from Dh-735 are not zoned, and the meteorite lacks enstatite, isolated grains of olivine and pyroxene in the matrix, tochilinite and Ca,Fe-oxysulfides [1]. In contrast, Dh-225 contains all of these components. Ca-carbonates in Dh-735 are abundant, associated with phyllosilicates and occur often in veins.

Dh-225 and Dh-735 have similar oxygen isotopic compositions (Fig. 1), close to the MCC's [2]. Similar to the MCC's, the matrices of these stones show high EPMA totals, depletion in Fe and S, and the presence of small grains of troilite, taenite, and tetrataenite. The matrix of Dh-735 is more depleted in Fe than Dh-225 and the MCC's. The bulk composition of Dh-225 also has both a low H_2O-content (1.76 wt%) and low Fe.

Discussion. Dh-225 and Dh-735 supplement the MCC group, being its first non-Antarctic members. Similar to the MCC's, they have experienced heating events after aqueous alteration in CM parent asteroids. However, the presence of tochilinite, zoned olivine grains and Ca, Fe - oxysulfides in Dh-225 contradict this interpretation. That might indicate a possible episode of aqueous alteration, followed by a heating event. The low thermal stability of tochilinite, which decomposes at 245^{o} C to troilite, indicates that it could have formed after the heating event [3]. This difference in post-accretional histories of Dh-225 and Dh-735 has not affected their oxygen isotopic systematics. They may represent a group of carbonaceous chondrites from a different oxygen reservoir.

References. [1] Ivanova et al., (2002) *LPS XXXIII*, #1437 CD ROM; [2] Clayton and Mayeda (1999) *GCA* 63, 2089-2104; [3] Fuchs L.H. et al., (1973) *Smithson. Contrib. Earth Sci*., 10, 1-39.

Fig. 1. **Oxygen isotopic compositions**