Dhofar 490, 1084

Anorthositic fragmental breccia

34.05, 90 g

Figure 1: Dhofar 1084 as found in the Dhofar region of Oman in 2003 (photo from Haberer meteorites). Scale cube is 1 cm.

Introduction

Dhofar 490 was found in the Dhofar region of Oman in March 2001 (Figs. 2 and 3). Dhofar 1084 (Fig. 1) was found in the same region in October 2003 (Fig. 3). The meteorites are dark grey, fusion crusted, and exhibit terrestrial weathering with gypsum, calcite and celestite present on the outside (Russell et al., 2003). They have been paired on the basis of similarity of texture, mineralogy and composition.

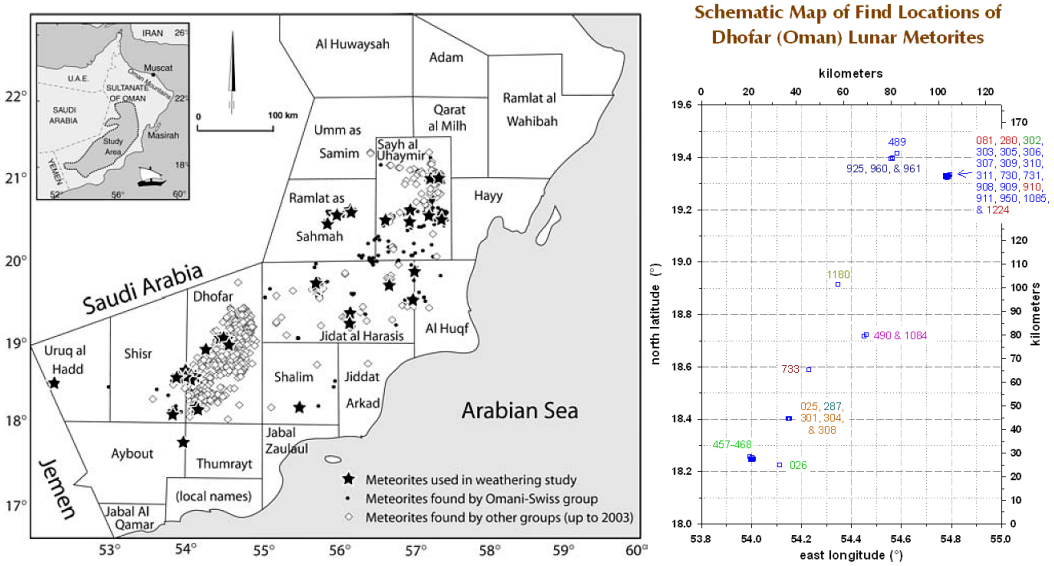

Figure 2 and 3: Location maps of the Dhofar region in Oman (from Al-Kathiri et al., 2005) and the specific coordinates for Dhofar 490 and 1084 (purple, both near center).

Petrography, mineralogy, and chemistry

This meteorite contains clasts (< 3 mm in size) embedded in a dark fine-grained glassy devitrified matrix (Fig. 4; Russell et al., 2003). Clasts include microporphyritic impact melt breccia, gabbroic anorthosites, and large plagioclase feldspars. Feldspar compositions vary from An_{92} to An_{98}, and olivines from Fa_{30} to Fa_{50}. Augites are present and some contain pigeonite lamellae. There are no basalts or glassy spherules reported. Accessory minerals include FeNi metal and ilmenite. These two stones contain high Al_2O_3 and low FeO and Th contents (Korotev, 2006) indicating that Dhofar 490/1084 is a feldspathic highlands breccia with minimal to no basaltic or KREEP components (Fig. 5). This is consistent with the reported feldspathic mineralogy (Russell et al., 2003; Korotev, 2006).

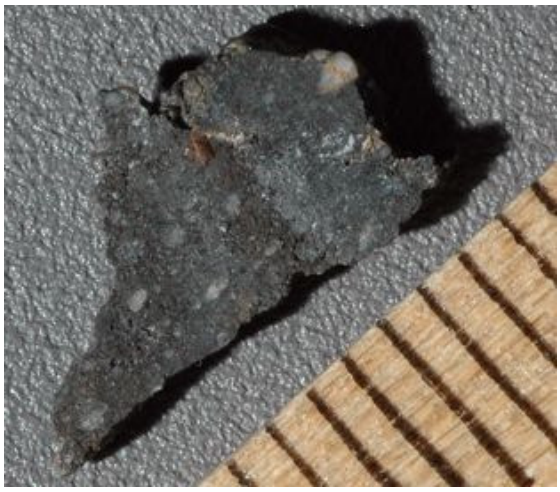

Figure 4: Cut slab face of Dhofar 490 illustrating its dark interior. Image from R. Korotev. Scale divisions are 1 mm.

Radiometric age dating

There are no known studies.

Cosmogenic exposure ages

There are no known studies.

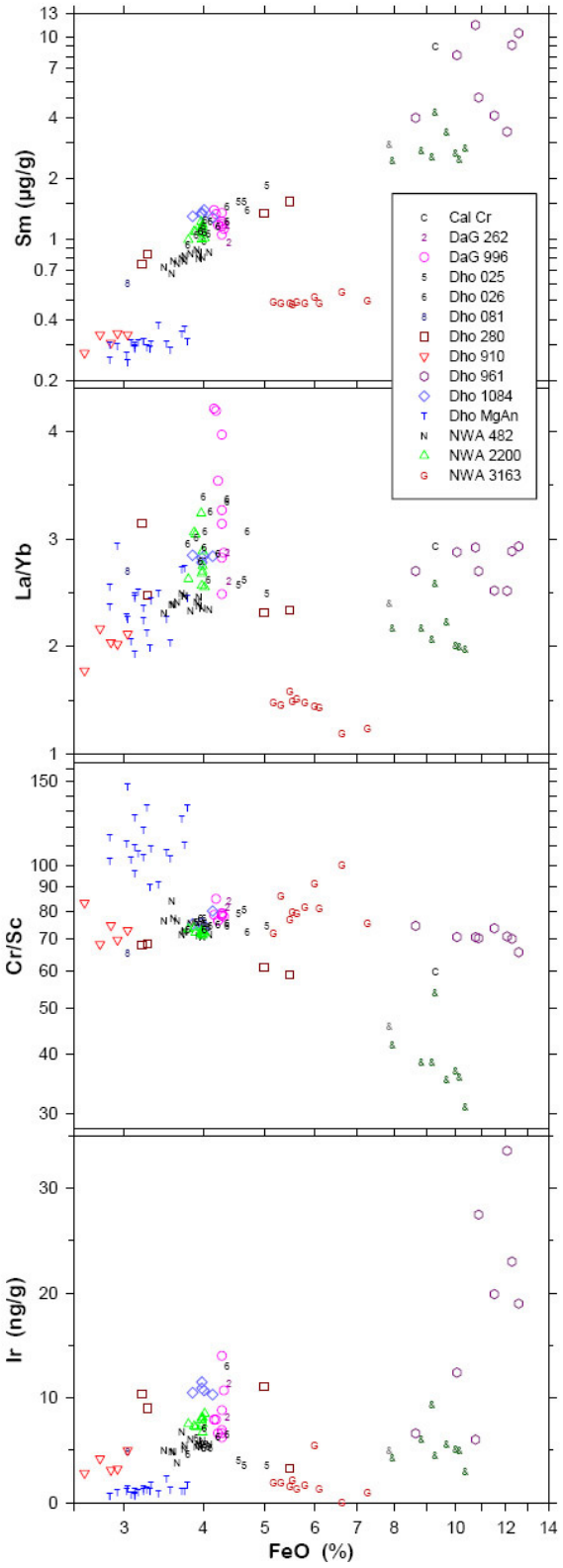

Figure 5: FeO vs. Sm, La/Yb, Cr/Sc, and Ir for a large number of lunar meteorites, including Dhofar 1084 (open blue diamonds).The composition of Dho 1084 is similar to a large group of lunar feldspathic meteorites (from Korotev, 2006).