
The Kaidun meteorite total mass (fall, 3.12.1980, 15°0′ N, 48°17′ E) is ~2 kg, of which 841 g was sent in the collection of the USSR Academy of Sciences. We report here results of detailed mineralogical and petrographic study of small fragments from the main samples of the Kaidun meteorite by routine optical microscopic and microprobe technique.

The meteorite is polymict carbonaceous breccia containing a set of the highly different types of the meteorite matter described as Kaidun I, II, III, and IV.

Kaidun I is the main part of the meteorite. It surrounds the xenoliths of other matter types and shows a breccia texture. The matrix (near 70% of the material) consists of phyllosilicates with various composition, carbonates of Ca, Mg, and Fe, aggregates of submicron magnetite crystals and carbonaceous material. The high-temperature association represents of chondrules (~5 mm), mineral grains and its aggregates. The chondrules compose of homogeneous enstatite (Fs 2.7, Wo 6), olivine (Fa 3) and kamacite (Ni 5.9%). Grains and aggregates consist of pyroxenes (Fa 2.16), olivines (Fa 3.5), kamacite, troilite, pentlandite (Ni up to 16%), oxysulfides and magnetite (sometimes with high Ni content - up to 8%). We have found replacement textures which was the results of oxidation and hydration processes for some chondrules, mineral grains and its aggregates. There are a few fragments of CAI consisting predominantly of hibonite and perovskite. On the base of the complex of characteristics the Kaidun I matter can be defined as CV2.

Kaidun II is presented by xenoliths of black opaque carbonaceous material containing carbonate and olivine grains (up to 5 μm), aggregates of submicron magnetite crystals and rare grains of sulphides and metal. There are patches with more compact structure and without grains of carbonates, olivines and other. The material corresponds to CI.

Kaidun III xenolith exhibits a coarse crystalline texture and contains euhedral pyroxene (En 99), rare - plagioclase (An 1.5-6) grains and interstitial metal-sulphide and sulphide aggregates consist of kamacite (Si 2.8%), troilite (Cr .9%), daubreelite, niningerite, djerfisherite and schreibersite. Chondrules are absent. Some silicates contain rare grains of silica. Fe,Ni in metal-sulphide aggregates show replacement texture by aggregates of phyllosilicates and Fe-hydroxides. On the base of the mineral composition and texture we classified the Kaidun III xenolith as EH 4.5.

Kaidun IV xenoliths show chondritic texture and contain matrix consisting of crystal fragments of enstatite (En 99), olivine (Fo 99), kamacite (Si .7%), and Cr-troilite (Cr 4.5%), which surround preferentially radiating pyroxene(<.3 to 6 mm), rarely barred pyroxene or olivine-pyroxene chondrules and their
fragments and large (up to 1 mm) xenomorphic metal-troilite-
schreibersite aggregates. Diopside, plagioclase (An 5), devit-
rification glass, silica, whitlockite and ferroan alabandite are accessory phases. Silicates of Kaidun IV are rather simi-
lar in their composition to those in EH, while opaques - to those in EL.

The breccia structure is rather characteristic of chond-
ritic meteorites (1,2,3). Usually the chondritic breccias are
monomict but in some cases there are mixtures of different ty-
pes of meteorites - ordinary and carbonaceous (2). The set of
the xenoliths in the Kaidun is unique and give arguments for
some conclusions about meteorite genesis.

1. The coexistence within the same meteoritic body of ex-
tremely various chondritic material that extremely different
on the reduction-oxidation state and therefore formed in a very
different environment (and places) in nebula suggests intensi-
ve mixing during processes of meteorite parent body formation.

2. The presence of two different enstatite chondrites in
the carbonaceous one and the compositional characteristics of
the enstatite chondrites may assumes that these enstatite chon-
drites were generated in the same meteoritic parent body.

3. The hydration and the oxidation of the Kaidun material
could take place either in a regolith of the Kaidun parent bo-
dy or during a process of an agglomeration of the parent body.
The coexistence of the hydrated ferric minerals and specific
"reduced" sulphides in Kaidun III indicates on extremely un-
equilibrium conditions of the local low-temperature alteration
of the initial matter.

References:
and Their Meteoritic Analogs", LPI Tech. Rep. 82-02,
65-83.