



Mont Dieu meteorite

In 2006 the RBINS became the owner of a recently found iron meteorite. It is one of the biggest meteorites ever found in Europe: a brown rusty mass, some 80x40x40 cm in size, and having a weight of approximately 435 kg;

The meteorite was found in the north of France, in the neighbourhood of the town Sedan, close to Mont Dieu wood (hence the name). Other and smaller samples of this meteorite find were collected in 1994. The present sample, the biggest one, has been excavated in 1999.

The meteorite was first shown to the public during the exposition "Science in the palace" from the 19th of July to the 10th of September in the Royal Palace. The meteorite is on exhibition now in the mineral hall of the RBINS until it will be permanently exposed in the dinosaur hall from November 2007 on.

The Mont Dieu meteorite is classified on the basis of its chemical composition as belonging to the IIE group. There are still a lot of unsolved questions concerning this meteorite group related to the inclusions of very divergent nature and especially the variable age determinations.

Composition: This iron meteorite is a fine octahedrite with sulfide- and silicate inclusions. Octahedrites are composed of the minerals kamacite and taenite, both FeNi-alloys, where the Ni content generally varies between 6.5 and 16%. Cooling results in a very specifically octahedral structure: the Widmannstätten pattern (fig. 1). The slower the cooling of the meteorite the larger the crystals formed. Cooling was apparently so fast that this pattern developed in small separate grains. The Fe-Ni matrix contains inclusions of sulfides (troilite FeS) and small irregular crystals of schreibersite (Fe, Ni)₃P, chromite FeCr₂O₄ beside the oxidised material at the outside.

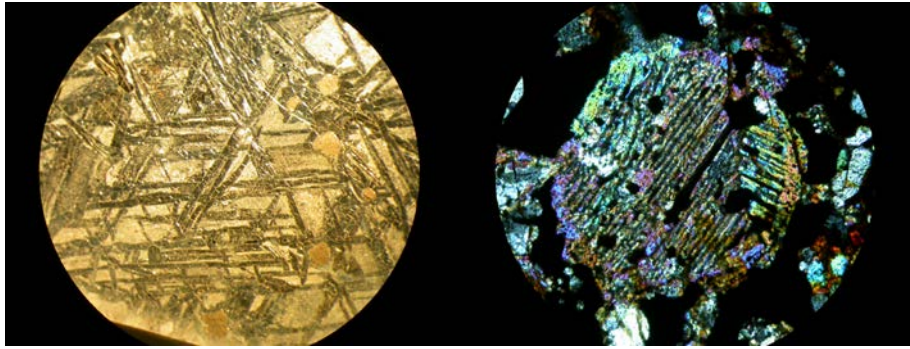


Fig 1. Widmannstätten structure in the Mont Dieu meteorite (12x) Fig 2. Chondrule of barred olivine (63 x)

It is the silicate inclusions that make the meteorite very interesting and of wide scientific importance. They are relatively large, angular to rounded and they will help us to determine the type and age of formation of the asteroid. In contrast to the silicate inclusions of other meteorites of the IIE-type, this meteorite contains some well recognizable chondrules. Some authors think that this meteorite could therefore belong to a type of asteroid that also provided the H-chondrites. Because there still is a lot of discussion concerning the inclusions of the IIE-type, this meteorite could provide valuable information in this discussion.

The research at present is performed in the RBINS by H. Goethals and W. De Vos of the department of general geology and mineralogy. They are supported by prof. Ph. Claeys of the department geology of the VUB in association with a thesis student N. Vandendorre and prof. J. Hertogen of the KULeuven. On the basis of the first results a research plan will be established in which several local and foreign scientists and several institutions will be addressed.

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