Petrology and mineralogy of Dar al Gani194 CO chondrite

Takeshi Iwamura[1], Hirokazu Fujimaki[1]

[1] Inst. Min. Pet. Econ. Geol., Tohoku Univ.

Dar al Gani 194 meteorite is a carbonaceous chondrite found in the Sahara Desert in 1999 , but nobody studied it in detail. This study consists of analysis petrographical , chemical , and mineralogical properties of the sample , and its summaries.

In this study , I tried to determine the chondrite group of the Dar al Gani 194 from analysis of modal composition and bulk composition. Bulk chemistry was analyzed by X-ray fluorescence spectrometry(XRF) and inductively coupled plasma mass spectrometry(ICP-MS). From analysis of bulk chemistry, Dar al Gani 194 was only able to be classified into CO or CV, because of similarity of bulk compositions of CO chondrite and CV chondrite. Petrographic features of chondrite , however , clearly indicated that Dar al Gani 194 is CO chondrite because its chondrule mean diameter is about 0.12 mm.

CO chondrites are all petrologic type 3. Type 3 is thought to be the most primitive class because of its heterogeneous composition of silicates and amorphous mesostasis. Many parameters which indicate that type 3 chondrites also have metamorphosed are found out by many researchers (e.g.McSween 1977 , Keck and Sears 1985 , Scott and Jones 1990). For example , compositions of chondrule olivines become more Fe rich , up to 36 mole% Fayalite. Kamacite has also correlation with its Ni and change their Cr and Co amounts by progress of metamorphism.

By its compositional properties , it was cleared that Dar al Gani 194 chondrite is classified into petrologic subtype 3.1-3.3. Although these subdivisions suggests nearly no experience of thermal metamorphism , it was unable to determine its petrologic subtype in detail. It is necessary to research its matrices or boundary of mineral to watch alteration in nanometer revel for determine and separate the degree of second processes from primary properties.