# XRD Analysis of Crystal Structure of the Fragment of the Campo Del Cielo Meteorite

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Meteorites are the key, and often the only source of information about the pre-planetary and planetary early history of our solar system [1]. Currently, the following classification of meteorites: stone (aerolites) stoney-iron (siderolites) and iron (siderites), depending on the ratio of silicate minerals in them, and nickel-iron [2].

X-ray analysis was investigated of the fragment of iron meteorite Campo del Cielo, measuring 1.5 cm by 2 cm, weighing 13.55 grams. The crystal structure of the samples were examined for general purpose diffractometer «DRON-3» by powder method with copper radiation (Cu K$\overline{\alpha}$). Survey was carried out in the range of angles from 10° to 100°.


Figure 1 – Sample of meteorite.

It was found that the basis of the structure of meteorite Campo del Cielo is native iron of cosmic origin – a compound of minerals kamacite (Fe,Ni) and taenite (Fe, Ni). There are also the inclusions of minerals phase: troilite FeS, sphalerite ZnS, daubreelite $FeCr_2S_4$, alabandite MnS – group of sulphides; enstatite $(Mg,Ca)SiO_3$, hedenbergite $CaFeSi_2O_6$, pigeonite $(Ca,Fe)_2Si_2O_6$, olivine $(Fe,Mg,Mn)_2SiO_4$, plagioclase $(Ca,Na)(Al,Si)[AlSi_2O_8]$ – silicate group; graphite C, chromite $FeCr_2O_4$, cohenite $Fe_3C$ and schreibersite $(Fe,Ni)_3P$.

1. Dodd R.T. *Meteorites*: Trans. from English. (M.: Mir: 1986).
2. J.I. Goldstein et al., Chemie der Erde, 69, 293 (2009).