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SCIENTIFIC REPORT: ANALYSIS OF IRON METEORITE SAMPLE

Project prepared for

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1. **Introduction:**

Two samples of iron meteorites were studied.

Studied meteorite sample composed of iron fragment 94.2 g weight. This sample was repolished and leached in alcohol solution of the nitric acid. From this sample fragment 2.14 g was cut for chemical analyses.

Sample was analysed for Ni (Nickel), Co (Cobalt) and Au (Gold) content. All chemical analyses were performed on ICP MS mass spectrometer with solvent based extraction.

2. **Results:**

Leaching polished surface of iron meteorite in acid alcohol solution week **Widmannstatten pattern** has been developed (Figure. 1). This pattern is diagnostic and characteristic for **octahedrite**.

Figure 1. Photo of internal structure of studied iron meteorite.

In this structure 8 to 20 mm long and about 2-3 mm thick **kamacite** crystals cross each other. However typical octahedral patterns are not clearly developed probably because of impact distortion. In many places skeletal schreibersite

$(Fe,Ni)_3P$ and troilite inclusions are present. The Neumann bands are also visible in the etched kamacite crystals, which is characteristic of impact metamorphism in iron meteorites. Meteorite is also very heavily oxidised which stained some places.

Nickel content in this meteorite fragment is 7.3% and Cobalt is 0.41% (see Table 1) which gives Ni/Co ratio 17.8 which is characteristic for meteorite iron. Very low Gold content (below 1 ppm) in this sample prove it extraterrestrial origin.

Table 1 Elemental composition of studied iron meteorite samples.

Element	Units	Sample (metal fragment)
Nickel (Ni)	%	7.3
Cobalt (Co)	%	0.41
Gold (Au)	ppm (mg/kg)	<1

3. Conclusion:

Studied metal fragments belongs to octahedrite group of **iron meteorites**.

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