

Two different fingerprinted impacts in one layer: a new find of altered meteoritic remnants in the Cretaceous-Paleogene boundary clay in Lechówka, Poland

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Paleometeorites are extremely rare finds in geological sediment record. Described here fossil remnants of meteorite are probably the first finding of extra-terrestrial iron connected with the Cretaceous-Paleogene boundary. The total mass of the meteorite is 1.8181 g and it is represented by 19 fragments and dust. Geochemical and petrographic analyses of the meteorite from Lechówka (Poland) reveal the presence of Ni-rich minerals, with their total amount of 2-3 wt%. In the Cretaceous-Paleogene boundary layer from Lechówka a platinum group elements, Ir anomaly as well as presence of microspherules were described as a result of the Chicxulub impactor.

The meteorite from Lechówka is the first altered iron meteorite from the K-Pg boundary. The presence of primary kamacite, taenite, and schreibersite enclosed in secondary Ni-rich oxides/hydroxides confirms the extraterrestrial origin of the material studied. It appears that the meteorite from Lechówka represents an individual local meteoritic fall. Undoubtedly, the location of the paleometeorite remains in the same sediments with the PGE anomaly connected with the Chicxulub event makes it unique and unusual. The high degree of weathering did not permit the chemical classification of the meteorite fragments. However, the recognized mineral inventory, lack of silicates, and their pseudomorphs and texture suggest that these remnants of an iron meteorite.

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