

Collection of spherules and melt fragments of Nio meteorite and its significance.

Yasunori Miura[1], # Yuhki Uedo[2]

[1] Earth Sci., Yamaguchi Univ, [2] Earth Sci., Yamaguchi Univ

http://www.sv.cc.yamaguchi-u.ac.jp/~dfb30/IFIE00/IFIE_e.html

Nio meteorite is H3 chondrite fallen in Nio, Yamaguchi in 1897 as meteorite shower. There is mystery of collected number of Nio meteorite that we can check only three meteorites from four official data of recorded fragment data. Present research suggests that there are four peaks of concentration of about 1,000 spherules.

We have collected 36 small melted fragments data. It is significant for new development of spherule origin in this study that Fe-, FeNiCu-bearing spherules can be formed by burning at atmosphere of the Earth.

Spherules formed by impact events on the Earth can be reserved at water-rich area of the sea-bottom or pond/lake to obtained finally at geological layers or boundaries on lands. Although iron-rich spherules are considered to be originated from impact craters, geological boundaries or cosmic dusts so far, but there is few report of iron-rich spherules from meteorite shower. Nio (or Niho) meteorite of ordinary chondrite of H3 has been fell into north district of Yamaguchi city on August 8, 1897. Main block (Nio-1) was recovered at wet rice-field with water for rice. Second block (Nio-2) was found at bamboo bush of Shingyo-Ji temple northeast side. Tiny mass (Nio-3) was found near rice-field at Miyano, Yamaguchi-city, which are 6.2km southwest from major Nio impact site. Rice-field which consists of mud is based on dry hard layer of mud in Japan, which is the place to concentrate many spherules and melted meteorite fragments. From many spherules of 1212 pieces indicate that there are four peaks of concentration, resulting in new evidence for mysterious number of Nio meteorite. 36 melted fragments indicate that

there is more large fragment in different rice-field. Meteorite fragments of Nio meteorite are ca. 3mm x 2mm in size, with irregular, melted surface with heterogeneous texture. Composition is Fe-Ni rich mixture with Si, Al, Mg, Na, K, Ca, Cu, Zn, with larger content of Fe (57%) and Ni (2.5%) of this fragmental surface. Fusion crust shows 10 times Ni concentration, though original bulk composition of Nio meteorite is Fe (22%) and Ni (0.2%). From muddy stones of deeper place (ca. 50cm in depth) of the Nio-1 impact site, 20kg in total weight of mud, there are four types of spherules of tweedy, lamellae, polyhedral, irregular domain, and mixed types texture (from 10 to 70 μm).

It is significant for new development of spherule origin in this study that Fe-, FeNiCu-bearing spherules can be formed by burning at atmosphere of the Earth, and existing direct from original meteorite

which is not from terrestrial surface. Similar elements can be found also from Apollo

11, 12 lunar samples and enstatite chondrites

which will be next target for development.