IDENTIFICATION OF NEW METEORITE, MIHONOSEKI (L), FROM BROKEN FRAGMENTS IN JAPAN; Y. Miura and Y. Noma, Faculty of Science, Yamaguchi University, Yamaguchi 753, Japan.

New meteorite of Mihonoseki fallen in Shimane-ken was identified by fine broken spieces by using energy-dispersive scanning electron microprobe analyzer. It shows fusion-crust (i.e. Fe-Si melt), meteoritic minerals (kamacite, taenite, troilite, amorphous plagioclase etc.) and chondrule with clear glassy rim. Mineralogical, and petrological data of several fine grains suggest that broken fragments of Mihonoseki is L3/4 chondritic meteorite which is the first identification in Japanese fallen meteorite. The prompt identification method of meteorite-fragment will be applied to the next lunar, Martian and Asteroid explorations, as well as meteorite fall on the terrestrial surface.

## 1. Sample

The sample used in this study is several broken speices of Mihonoseki meteorite fallen and found in house of Mr. M. Matsumoto, ca. 22, December 10, 1992. Main mass of about 6.5 kg and 25x15x10 cm was first found almost without fusion-crust, because it passed his roof, two ceiling (two floor) to the basement of his house. Main purpose of the present study is to identify the meteorite from broken speices distributed in his house. Almost main fragments near the roof were completely lost for two days by his repair of the roof for rain-fall, because he thought that it was thunder-storm and did not realize that it was meteorite effect.

We collected several small fragments by magnet on two carpets, by helping with Mr. K. Handa on December 12, 1992. Ten grains of 2mm in width were selected to examine Scanning electron microscopy (SEM) with energy-dispersive device (EDX), JSM-5400 in Yamaguchi University.

## 2. Identification of meteorite from small fragment

The following three characteristic data suggest that it is really stony meteorites from small broken spieces distributed near fallen site within the house.

1) Fusion-crust (Fig.1): Analytical SEM data show that one big dark fragment is fusion-crust with Fe (69 to 78 wt.% FeO) and Si (7 to 17 wt.$SiO_2$) including silica grains (99 wt.% $SiO_2$, ca.10 to 50 $\mu$m in width) and irregular holes for gas passage. Fusion-crust with same Fe-Si composition is also found with silicates (Fig.1) but without silica grain. The two types of fusion-crust are due to different fragments of meteorite (i.e. only fusion-crust and fusion-crust close to unmelted silicates).
2) Meteoritc minerals: Kamacite and taenite of Fe-Ni metals are found by coexisting with silicate fragments. Troilite is observed with kamacite and silicates. Plagioclase-compositions (ca.8 to 13 mol.% An-content) are found in glassy matrix outside of olivine-chondrule.
3) Chondrule: Thin section with cross-nicols shows clear olivine chondrule rim, dark glassy matrix and pyroxene fragments, together with Fe-Ni metals.
This prompt identification method of meteorite-fragments will be useful method in the next unmanned exploration project of the Moon and Mars, together with new prompt method of meteorite fall on terrestrial surface.

## 3. Classification of chondrite

Pyroxene grains show two types of compositions [1]:

1) Orthopyroxene (including fusion-crust grains) shows Wo:0.0-2.0 (average 1.4), En: 68.6-81.2 (av.78.5 mol.%), and Fs:17.2-29.6 (av.20.1) with 14 % M.D. of percent mean deviation (in 14 analytical points).

2) Orthopyroxene (without any fusion-crust) shows less Fe composition of Wo:0.0-1.7 ( av.1.4), En:76.3-81.2 (av.80.0), and Fs:17.1-23.8 (av.18.6) with 8 % M.D. (in 7 analytical points). The pyroxene data with larger values of % M.D. (over 5% M.D.) indicate petrologic type 3.

Olivine grains of 14 analytical points (without fusion-crust) are Fo:75.1-79.3 (av. 77.7) and Fa:20.7-24.9(av.22.3) with 5 %.M.D [1]. Chemical group of the Mihonoseki fragments belongs to L-group (Fa:22.3, and Fs: 20.1). But petrological type from percent mean deviation of olivine compositions is 3/4 between 3 and 4. Although the main mass of the Mihonoseki should be examined for classification soon, the fragments near fusion-crust in this study belongs to L3/4. This is mainly because the heterogeneous fragments reveal range from L3 to L4 which will be known from classification of main mass.

**4. Evaluation of meteorites**

Mihoneseki meteorite is 41st meteorite of Japanese non-Antarctic meteorites, 32nd chondrite in Japan, and 11th chondrite of weight. But L3/4 chondrite of Mihonoseki is 'the first identified chondrite in Japan', though eight Japanese chondrites are not clearly classified.

**5. New additional chondrite in Japan**

New chondrite of 42nd in Japan was 'found' at December 28, 1992. The unnamed and un classified chondrite was found in Matsue-shi, Shimane-ken after reading news-paper of the Mihonoseki meteorite. The unnamed chondrite of 430 gr (85x65x5mm) with clear half-covered fusion-crust has been stored by Mr. H. Minao who was picked up within their car-transport ship during anchor of 9 km offshore near Tahara-ko, Aichi-ken, two years ago. He said that the deck was broken by 30 cm in diameter and ca. 15 cm in depth. He is now checking the rest of fragments to his crew members.

**References:**

[1]Dodd R. T. (1981): In Meteoritics (Cambridge Univ. Press), p.24,

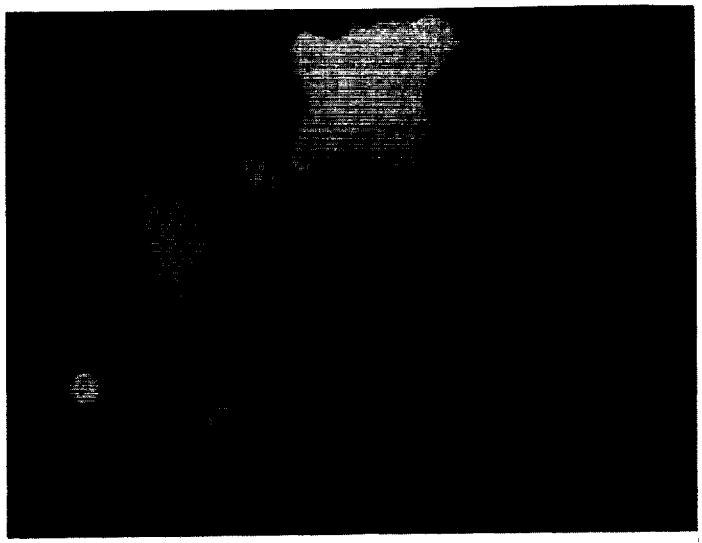

Fig. 1. BEI image of Mihonoseki (L3/4) fragment. Kamacite of Fe-Ni metal (white), Pyroxene $Fs_{18}Wo_{1.5}$ (gray grain of left-below), and fusion-crust Si-Fe melt (spotty gray of middle-below).