QUENCHED CARBON BLOCKS OF THE BARRINGER CRATER, U.S.A. Yas. Miura, Yamaguchi University, Yoshida 1677-1, Yamaguchi, 753-8512, Japan, yasmiura@yamaguchi-u.ac.jp

Introduction: Quenched chlorine (Cl) -bearing akaganeite and iron-nickel (Fe-Ni) oxides are not reported for various meteorites (included for Antarctic meteorites) and meteoritic impact craters [1-6]. The purpose of this paper is to elucidate chlorine (Cl)-bearing akaganeite and Fe and Ni phases originated from meteorites (including Japanese samples) and mixture of target rocks at the Barringer crater (USA) by the FE-SEM with EDX analyzer (JEOL7000F), Yamaguchi, Japan [1-6].

Formations of akaganeites in meteorites: Chlorine (Cl)-bearing akaganeites are found at various meteorites of Nio, Mihonoseki, Carancas and NWA869 chondrites and Kuga iron meteorites in this study (Table 1). Several Antarctic meteorites of chondrites are checked quickly in those fusion crusts, but characteristic flake textures of akaganeite are not found due to less chlorine contents.

Lunar and Martian meteorites found on Antarctica and Earth are also checked in those fusion crusts, but less chlorine contents do not form characteristic flake textures of akaganeite in this study so far.

Artificial formations of quenched akaganeite are obtained in author's laboratory with less small and Cl-contents. Main difference between artificial akaganeite at laboratory chemical reactions and meteorites are content of carbon which originally from explosive captures of meteorites and air in the meteorite samples.

Recently author describes akaganeite from spherules of Takamatsu buried crater in Japan [5], which is explained by secondary formation from first meteoritic akaganeite with flake texture [5] (Table 1). There are following three types of akaganeite formations as shown in Table 1:

1) *Fusion crusts of meteorites*: akaganeite shows flake texture at atmosphere, which main compositions are collected from meteorites.

2) *Artificial formation:* akaganeite shows small texture without carbon (and sometimes chlorine), which main compositions are starting elements.

3) *Secondary formation:* akaganeite shows crystalline textures which are difficult to its original sources.

Formations of akaganeites in the Barringer crater: Carbon blocks of the Barringer crater (Arizona, USA) show aggregates of irregular grains of carbon, Fe-Ni oxides and carbon with Fe-Ni as shown in Figs. 1 to 6. Impact reactions of the Barringer carbon blocks are summarized as follows:

1) Carbon blocks consist of three blocks as follows:
   a) pure carbon (with trace Fe and Ni),
   b) Fe and Ni oxides as very fine grains,
   c) Carbon with minor Fe and Ni.
2) There blocks are not direct from mineral and texture of iron meteorite.
3) Micro-diamond carbons are aggregates of very fine carbon grains.
4) Akaganeite formed at fusion crusts of iron meteorite are concentrated around the pure carbon blocks during ejecta concentration of cratering with target rock of limestone (with Ca) and sandstone (with Si).

Table 1. Akaganeite (Fe, Ni, Cl-rich) compositions at the Nio, Kuga, Mihonoseki, Takamatsu (Japan), Carancas (Peru) and NWA869 samples [5, 6].

Sample	Texture	Remarks
1) Formation of quenched fusion crusts:		
Nio, NWA869	Fine needle	Rosettes
Mihonoseki		
Kuga, Carancas	Fine fiber	Rosettes
Barringer crater	Fine flake	Rosettes
2) Secondary formation:		
Takamatsu	Crystalline shape	from akaganeite
3) Special chemical reaction:		
Artificial	Crystalline	needle shapes

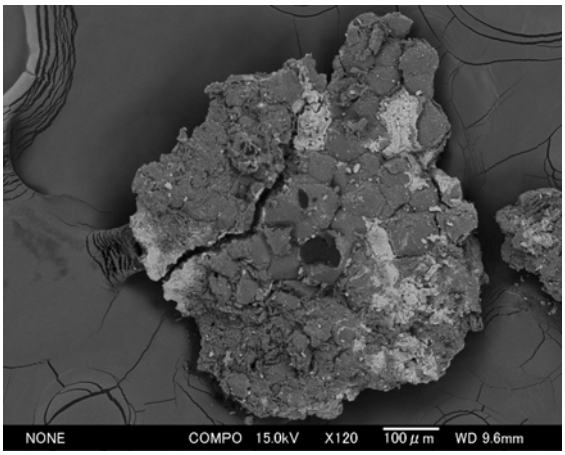

Fig.1. SEM image (BEI) of the Barringer carbon blocks (with Fe-Ni oxides shown by white images).

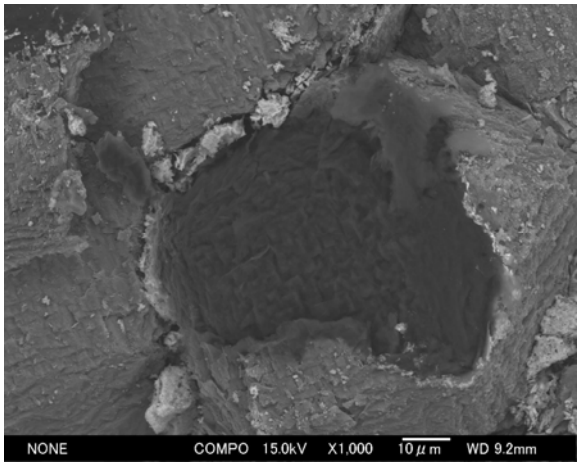

Fig.2. FE-SEM electron micrograph of Cl-bearing akaganeite (white) and pure carbon block with minor Fe and Ni (dark) from the Barringer crater block (cf. center of Fig.1).

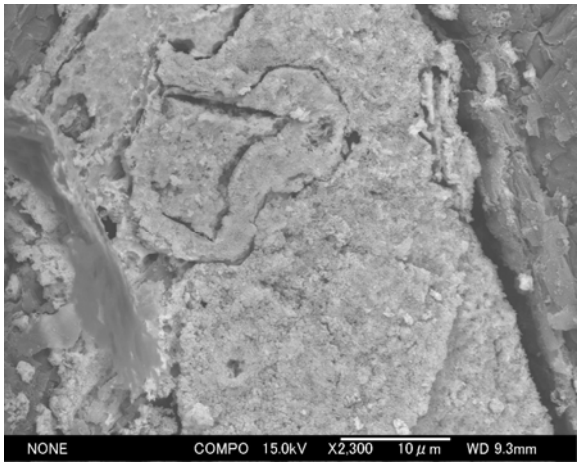

Fig.3. FE-SEM electron micrograph of very fine aggregates of Fe-Ni oxides in composition from the Barringer carbon blocks, USA.

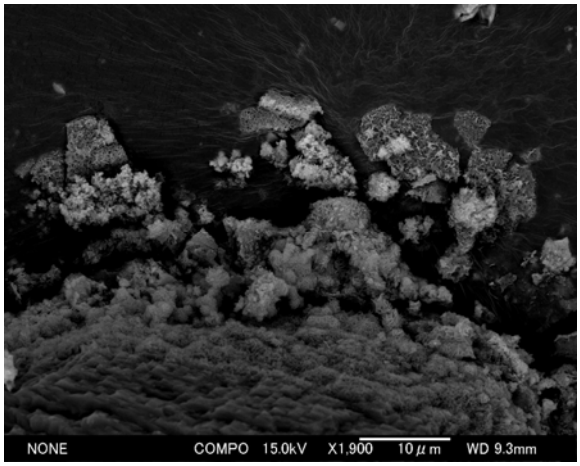

Fig.4. FE-SEM electron micrograph of Cl-bearing akaganeite with flake texture at the Barringer carbon.

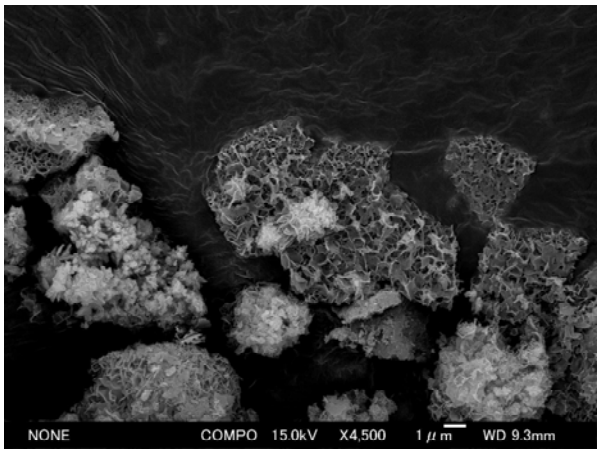

Fig.5. FE-SEM electron micrograph of Cl-bearing akaganeite with flake texture at the Barringer carbon block (cf. enlarged image of Fig.4).

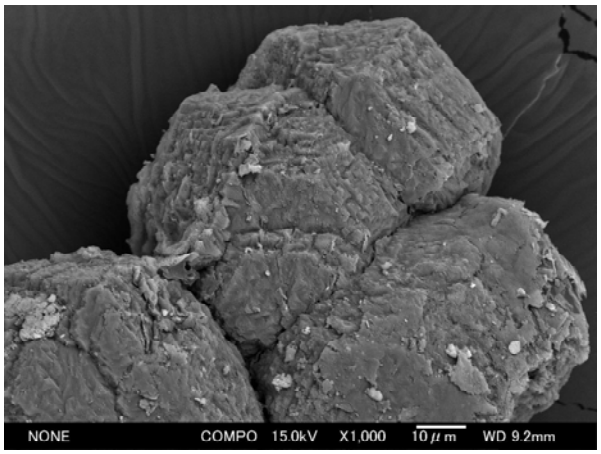

Fig.6. FE-SEM image of carbon with diamond planes of the Barringer crater, Arizona, U.S.A.

Summary: The present results are summarized as follows:
1) Akaganeites are classified as three formation processes including the Barringer crater..
2) The Barringer carbon block consists of three aggregates of carbon, Fe-Ni oxides and akaganeite.

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