Electron microanalyses of bacteria-like microspherule-texture from Kuga meteorite by shock-metamorphism

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The present study is summarized as follows:

1) Fusion crust of Kuga iron meteorite found in Kuga, Iwakuni, Yamaguchi Prefecture shows various spherule textures with Fe, Ni oxides from iron meteorite composition by electron microanalyses by author.

2) The micro-spherule texture reveals single or several chained textures, which were formed at shock-metamorphism of iron meteorite in atmosphere on the Earth. One fragment contained many micro-spherule textures with carbon matrix, together with several crack veins in whole area to be quenched from high-temperature during melting in atmosphere. Micro-spherules consist of two types of ca.10micrometer and 100nanometer in size by high-resolution electron observations.

3) The two types-texture of Kuga iron meteorite is similar to size and some shape of bacteria-like texture of Martian meteorite ALH84001, though there are differences of contact part, carbonate spherule composition which could not be found in Kuga fragments, resulted in different condition and environments with Martian meteorite ALH84001.

4) Although there are some differences of texture and composition, however these textures in Kuga meteorite are considered to be formed by shock metamorphism. The present study indicates in Kuga iron meteorite in Japan that cell-like texture of primordial life can be formed by shock wave in real meteorite sample, which has been indicated by author's paper (1997) of formation of spherule texture at primordial age.