

**FORMATION OF CARBON-RICH GRAINS IN AIR BY METEORITIC SHOWERS OF THE NIO AND CHELYABINSK.** Y. Miura, Yamaguchi University, Yamaguchi, Yamaguchi, 753-0074, Japan. [yasmiura50@gmail.com](mailto:yasmiura50@gmail.com)

**Introduction:** Recently carbon-rich grains can be obtained at collision explosions in Earth's atmosphere by meteorite showers of the Nio and Chelyabinsk meteorites [1, 2]. The purpose of the paper is to elucidate the formation of carbon-rich grains formed by meteoritic showers in air.

**Carbon-rich grains of the Nio meteorite:** The Nio meteorite (H3-4) fallen in Japan on August, 1897 shows meteoritic shower collected many fragments of 1,212 spherules and ca.40 pieces on the old rice-fields [2], where carbon-rich grains can be obtained as FeC in compositions at xenoliths-like materials in the spherules.

**Carbon-rich grains of the Chelyabinsk meteorite:** The Chelyabinsk meteorite (LL5) fallen on February, 2013 showed meteoritic shower which have been collected many "fragments" at Deputaskiy, Russia (Nos.CH-19 to 21). All fragments are changed by the meteorite shower processes of carbon-rich (No.20), mixed (No.19) and complete new fragments (No.21). Sample No. CH-19 is mixed with chondrite and carbon with isolated carbon-bearing grains. This indicates that meteorite shower produces carbon-rich grains above the terrestrial surface [2]. Sample No. CH-20 shows primordial chondritic composition with considerable carbon contents. Sample No. CH-21 shows SiC in composition. This indicates that meteorite shower produces single grains of moissanite SiC above the surface sediments [2]. All exploded fragments in air contain significant carbon contents with the analytical FE-SEM (JEOL) instrument, where carbon-separation to show the most carbon-rich grains (>80%C) are only obtained at the completely mixed sample (No.CH-19) [2].

**Carbon concentration sites:** Terrestrial carbon sources are complicated from the deep interior to shallow surface in active planet Earth as unknown source, though there are no consideration on sources of meteoritic asteroids concentrated on meteoritic shower explosions in air. The present results are new carbon-concentrated source within Earth's air by meteoritic shower process, which might be significant clues for carbon-rich materials on the air planet of the Solar System [2, 3].

**Summary:** The present study is summarized as follows: 1) Carbon separation and concentration process can be formed at explosions of meteorite shower in air of the Nio (Japan) and Chelyabinsk (Russia) meteorites. 2) The present results suggest air-production of carbon and carbon-rich FeS and moissanite SiC grains. 3) Carbon concentration process by meteoritic explosions is new impact in air between extraterrestrial and terrestrial locations.

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**References:** [1] Miura Y. (2013): LPS XXXIV, #1654, #3098. [2] Miura Y. (2014): Inter. Mineral. Assoc. 2014 (Johannesburg, SA) #689. [3] Miura Y. (2015). LPS XXXVI, #1666, 1811.