Fall and recovery of Ozerki L6 meteorite

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On June 21, 2018 at 01:16:20 UT a bright fireball was witnessed in the Lipetsk Region, Russia as well as in the surrounding regions of Russia and Ukraine. The smoke trail in the atmosphere was recorded by EUMETSAT. According to NASA the calculated total impact energy of the impact was 2.8 kt in TNT equivalent [1]. The trajectory slope with the horizon was 80°, the entry velocity was estimated at 14 km/s, and the peak brightness was recorded at an altitude of 27 km.
Based on the available observations the consortium of scientists from the Ural Federal University, University of Helsinki and Finnish Fireball Network promptly identified probable meteorite shower using meteorite-production criteria [2]. The following dark flight simulations and the calculated strewn field lead to the prompt (within 2 days) recovery of meteorites on the ground. Here we present details from this field campaign, and is a natural follow-up from our successful recovery of the Annama meteorite observed by the Finnish Fireball Network on April 19, 2014 [3-7].
The recovered Ozerki meteorite was classified as ordinary chondrite L6 with a shock stage S4/5 and weathering grade W0. Most fragments represent samples of light lithology. Several fragments of dark lithology (shock-melted substance) have also been identified. The meteorites at the UrFU collection have roughly rounded shapes, their surface is covered with dark fusion crust, the interior is light colored, and contains visible shock veins.
Petrographic study reveals very rare chondrules in a coarse recrystallized matrix. The PO, POP, and BO chondrules are most common and mainly consist of olivine, plagioclase, low-Ca pyroxene ± chromite and blebs of troilite and FeNi-metal. Olivine, low-Ca-pyroxene, plagioclase, FeNi-metal, and troilite are the main minerals in the matrix. Grains of FeNi metal are represented by both individual phases (kamacite, taenite or plessite) and their intergrowths. Troilite inclusions were observed as particles of high porosity. The thickness of the fusion crust is up to 600 μm in thickness. Magnetic susceptibility log χ (×10-9 m3/kg) = 4.8. The enrichment of PGE in different metal grains and precipitation of pure copper was found in the shock-melted sample.

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