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Fázové složení artefaktů po Cu-Zn-Pb metalurgické aktivitě ze Smetanovy ulice v Jablonci nad Nisou (Česká republika)

Phase composition of artefacts after a Cu-Zn-Pb metallurgical activity from the Smetanova Street in Jablonec and Nisou (Czech Republic)

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Abstract

Slags and fragments of metallurgical crucibles with remnants of baked batch, originating from a newly discovered locality in the Smetanova Street in the town of Jablonec nad Nisou, were studied using an electron microprobe. A rich phase composition was found. The remnants of baked batch contain metallic droplets composed of copper or Cu-Zn alloys with variable compositions, both often enclosing also inclusions of lead. These metal droplets are enclosed in a matrix formed by a Pb-rich glass, willemite, hardystonite, zincite, tenorite, cuprite and Pb-oxides. Slags have always a hemi-crystalline structure and contain silicate glass, spinelides (gahnite, franklinite, spinel, magnesioferite, cuprospinel, thermoaerogenite, magnetite), plagioclase ($An_{68-97}Ab_{0-25}Or_{1-17}$*Cu-fs*$_{0-8}Slw_{0-1}$), K-feldspar ($Or_{54-77}Ab_{10-18}An_{9-22}$ *Cu-fs*$_{0-8}Cn_{0-3}Slw_{0-1}$), leucite, Ca-rich pyroxene, quartz, an unidentified Ca-Al-Fe-Mg silicate phase, zincite, tenorite, cuprite, Pb-oxides, Cu-S phases (anilite, spionkopite, geerite, digenite/roxbyite, djurleite), thiospinels (polydymite, fletcherite), sphalerite, lead, Cu-Zn alloys, copper, and remnants of (un)burnt coal. The used crucibles are common goods composed of quartzose fireclay. We suggest that the studied artifacts originated during a modern (<150 years) non-professional metallurgical activity focused largely to re-melting of metallic copper and brass. Heating of charged crucibles was realized in direct contact with burning coal. The aim of the studied metallurgical activity is not clear, it could be (i) a small hand-crafted workshop processing metal waste and producing small articles undemanding to alloy composition; (ii) an experimental hobby focused on practical learning of the metallurgical properties of the used metals, sulfides or alloys, or (iii) a crime-related activity aimed to prevent the identification of stolen artefacts made from non-ferrous metals.

Key words: *archaeometallurgy, Cu-Zn metallurgy, brass, slags, phase composition, chemical composition*

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