Material Research of a Decorative Bronze Circle from the Hallstatt Culture Period

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The paper deals with material research of a bronze circle from the Hallstatt culture period. The structure of bronze was observed with an optical microscope and scanning electron microscope. The structure corresponds to wrought tin bronze after recrystallization annealing. One original repair of the crack in the material which was done by cast bronze, was determined. The bronze contains a big amount of sulphide inclusions, which are oriented in a direction of forming material. Chemical composition of the alloy and non-ferrous inclusions were determined by the EDS analyser and minority elements were determinated by the XRF spectrometer . The bronze contains 9 to 10 wt. % Sn with minority elements Pb, Ni and Fe. XRD and SEM were used in order to identify nonequilibrum Cu-Sn phases. The results were compared with EBSD analysis. The nonequilibrium phase $Cu_{39}Sn_{11}$ was reliably determined by EBSD analyser.

Keywords: archaeological bronze, nonequilibrium phase, SEM-EDS, EBSD, XRD

Acknowledgement

Research is financially supported by the Czech Science Foundation (project no. P108/12/G043).

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Paper number: M201466