

# Chemical composition of non-ferrous artifacts from the Golden Horde settlements of the northern areas of the Lower Volga region

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## Abstract

© 2018 High Anthropological School University. All Rights Reserved. Earlier published and not published results of analyses of the chemical composition of wares from the non-ferrous metals occurring from the Golden Horde settlements of the central part of the Saratov region dated by the second half of the 13th-14th centuries were generalized in the article. The description of the chemical composition of wares is given for the groups distinguished by their functional purpose. The studied Golden Horde wares were compared by types of alloys with the materials of Novgorod of 13th-14th centuries. The materials of the Hmelevskoe I settlement (town) are the closest to Novgorod by composition of alloys, slightly farther are the materials of rural settlements of Ulus Jochi. Among the Golden Horde wares in general, in comparison with the Novgorod materials, it is much less made of lead-tin bronzes and much more from tin bronzes; it is slightly less brass objects in our materials, it is more wares from multicomponent alloys (copper, tin, zinc and lead) and 'pure' lead, and wares from 'pure' tin are absent at all. In the materials of Pskov of 13th-14th centuries, in comparison with ours, there are much fewer wares from 'pure' copper, and many more objects (even in comparison with the Novgorod materials) from brass and multicomponent alloys, with prevalence of zinc. These data allow the possibility of import of brass to the territory of the Golden Horde, as well as to Old Rus, from Western Europe, perhaps, through the Baltic region.

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## Keywords

Chemical composition, Golden horde, Non-ferrous metals, Saratov region, Settlements, Volga region

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