Research on Typical Corrosion Products of Bronze Artifacts Unearthed from the Sacrificial Area of the Sanxingdui Site

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Abstract:

A large number of bronze artifacts have been unearthed from the Sanxingdui site. Compared to the rich research on the types of artifacts and the sources of ores, there is relatively less summary of typical corrosion products and explanation of the corrosion mechanism. This study conducts a comprehensive analysis and detection of the corrosion products on bronze artifacts unearthed from the No. 3 and No. 4 sacrificial pits. It was found that there are various copper, tin, and lead corrosion products. These corrosion products almost do not contain the traditionally harmful rust containing chlorine, but some powdery corrosion products, such as non-crystal tin and lead corrosion products, have certain damage to the structure and strength of the artifacts and also have the characteristics of harmful corrosion. Moreover, further changes may occur with the dehydration of tin corrosion products, and conservation should be carried out in the subsequent process. Affected by the burial of ivory in the environment, there is a large amount of phosphate in the corrosion and most notably, a previously unreported lead-tin yellow corrosion product was found. Combined with environmental analysis, it is summarized that the main process that occurred during the burial of bronze artifacts unearthed from Sanxingdui is the oxygen-rich and water-retaining environment without chlorine corrosion, with the loss of copper and lead, and the tin corrosion products remain in the matrix, maintaining the original appearance of the artifacts, while forming a regular distribution of lead-rich and copper-rich layers on the surface.