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The Technological Analysis of the Ancient Ceramics Discovered from ‘Nanhai No.1 Shipwreck’

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中文摘要:

“南海Ⅰ号”沉船位于我国广东省阳江市，出水大量陶瓷器的产地研究及腐蚀产物研究是“南海Ⅰ号”研究的重要课题。本文利用微聚焦X射线荧光谱仪（μ-XRF）对“南海Ⅰ号”沉船出水部分的青白瓷、青瓷、绿釉陶的胎釉以及绿釉陶的腐蚀物进行成分分析，并利用体视显微镜以及拉曼光谱仪对绿釉陶表面的腐蚀物进行观察和物相组成分析。元素分析结果表明：一类青白瓷样品胎体具有低铝高硅的特点（Al_2O_3含量低于19%，SiO_2含量约73%），属江西景德镇湖田窑，而另一类青白瓷可能产自福建，具体窑口的确定还有待进一步对比分析才能得出明确的结论；青瓷样品胎体具有高硅低铝的特点（Al_2O_3含量13.32%~19.12%；SiO_2含量72.89%~78.30%），属浙江龙泉窑；绿釉陶样品的特征与福建地区瓷土较为符合，可能来自于福建磁灶窑。拉曼光谱物相分析结果表明，绿釉陶的主要腐蚀物的矿物组成为炭黑、白铅矿与磷酸铅。此项研究成果为出水陶瓷器的产地研究、陶瓷器腐蚀机理探究、出水陶瓷器保护等提供了重要依据。

英文摘要:

Nanhai No.1 Shipwreck' was discovered in Yangjiang City, Guangdong Province. Research on the origins of these out-water ceramics and corrosion products of ceramics play an important role. The component analysis of body and glaze of bluish-white porcelains, celadons, green

glazed potteries and the corrosion products specimens of green glazed potteries have been studied by using Micro-focus X-ray Fluorescence Spectrometer (μ-XRF). Then, the observation and phase analysis of corrosion products specimens of green glazed potteries were conducted by using Stereo Microscope (OM) and Raman Spectroscopy (μ-RS). Combined with ceramic archaeological literature, it ws found that: (1) some bluish-white porcelains are characterized by low content of aluminum and high content of silicon (content of Al_2O_3 is less than 19%, content of SiO_2 is almost 73%), which come from Jingdezhen Hutian kiln; another bluish-white porcelain may be from Fujian Province, which needs further support evidence. (2) The celadons all have a high content of silicon and low content of aluminum (Al_2O_3: 13.32%-19.12%; SiO_2: 72.89%-78.30%), which come from Zhejiang Longquan kiln; additionally, some celadons belong to lime glaze which possess more similar characteristics to Longquan kiln of the Northern Song Dynasty; some belong to lime alkaline glaze which possess similar characteristics to Longquan kiln of Southern Song Dynasty. (3) Green glazed pottery samples possess more similar characteristics to the Fujian area, which may come from Fujian CiZao kiln; in order to have in-depth research on corrosion products of green glazed potteries, representative samples are selected to have Raman spectroscopy analysis; the main compositions are black carbon, cerusite and lead phosphate. In this work, technology analysis has been carried out with some underwater ceramic of 'Nanhai No.1 Shipwreck' to identify some origins of ceramics. The results of this study provide an important basis for the study of the origin of the out-water ceramics, corrosion mechanism of ceramics, ceramic water protection of out-water ceramics amongst other aspects of ceramic origin determination.

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