

Gold enrichment in Staffordshire Hoard K349: results of SEM-EDX analysis

Object Type Pommel
Date 610-630

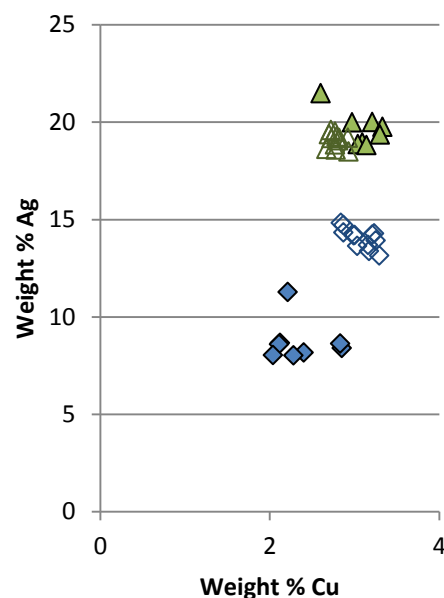
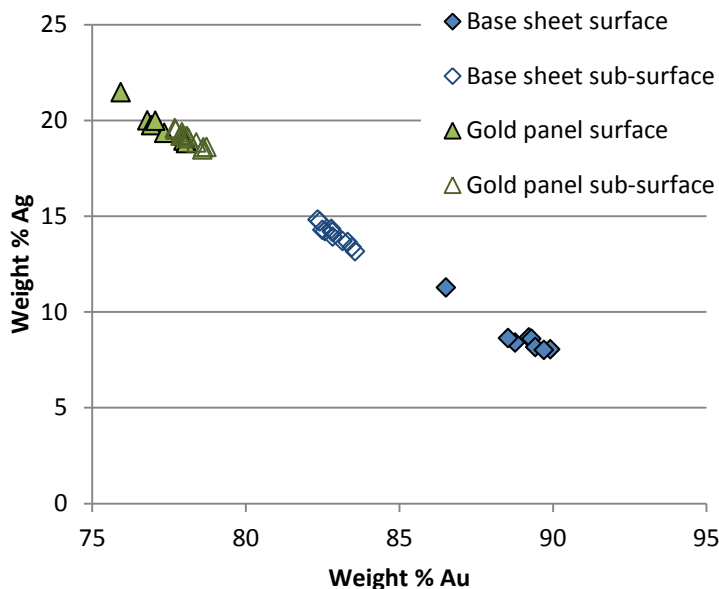
Decoration Filigree Glass
Garnet Other



SEM-EDX analysis was undertaken on the base sheet to which the wires were attached and also the cell walls of the panel with the green inlay.

Area analysed	No of analyses		Wt% Au	Wt% Ag	Wt% Cu
Base sheet surface	8	Average	88.9	8.7	2.4
		Standard Deviation	1.07	1.06	0.32
Base sheet sub-surface	12	Average	82.9	14.0	3.1
		Standard Deviation	0.41	0.51	0.16
Gold panel surface	8	Average	77.3	19.6	3.1
		Standard Deviation	0.75	0.88	0.23
Gold panel sub-surface	12	Average	78.1	19.1	2.8
		Standard Deviation	0.35	0.37	0.08

SEM-EDX surface and sub-surface compositions for each component analysed (the results are normalised). This analysis was carried out as part of the gold enrichment study. For full details of methodology and associated results see report PR07444-10 and PR07444-15



Plots of gold vs silver and copper vs silver contents, based on SEM-EDX analysis, showing the differences between the sub-surface and surface analyses.

SEM-EDX analysis of the sub-surface of the base sheet indicated a composition of approximately 82-84 wt% gold, 13-15 wt% silver, the rest being copper. The analysis revealed a c.5.3 wt% loss of silver from the surface of the base sheet (a difference of c.38%

This report contains unpublished research. Its contents should not be published without the permission of the Keeper of the Department of Conservation and Scientific Research.

SEM-EDX analysis of K349

from surface to core), which is indicative of treatment to deliberately enrich the gold colour of the metal. Only copper and small amounts of silver are normally lost from the surface during burial.

SEM-EDX analysis of the sub-surface of the panel indicated a composition of approximately 77-79 wt% gold, 18-20 wt% silver, the rest being copper. The analysis of the cell walls of the gold panel revealed no loss of either silver or copper from the surface of the object. Both components were made from a different gold alloy.

Eleanor Blakelock
Analysed December 2013

This report contains unpublished research. Its contents should not be published without the permission of the Keeper of the Department of Conservation and Scientific Research.