

Gold enrichment in Staffordshire Hoard K352: results of SEM-EDX analysis

Object Type Pommel
Date 610-630
Decoration Filigree Glass
Garnet Other



SEM-EDX analysis was undertaken on a range of components, including the separate cap, the sheet forming the panel and the base sheet to which the applied decoration were attached.

Area analysed	No of analyses		Wt% Au	Wt% Ag	Wt% Cu
Base sheet surface	8	Average	84.3	13.0	2.7
		Standard Deviation	0.78	0.78	0.11
Base sheet sub-surface	14	Average	81.6	15.6	2.8
		Standard Deviation	0.30	0.33	0.10
Top of cap surface	8	Average	85.6	12.5	1.9
		Standard Deviation	0.14	0.18	0.09
Top of cap sub-surface	12	Average	80.1	17.8	2.1
		Standard Deviation	1.36	1.39	0.07
Panel sheet surface	8	Average	91.7	7.4	0.9
		Standard Deviation	0.40	0.33	0.11
Panel sheet sub-surface	12	Average	80.3	17.1	2.6
		Standard Deviation	0.81	0.68	0.32

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

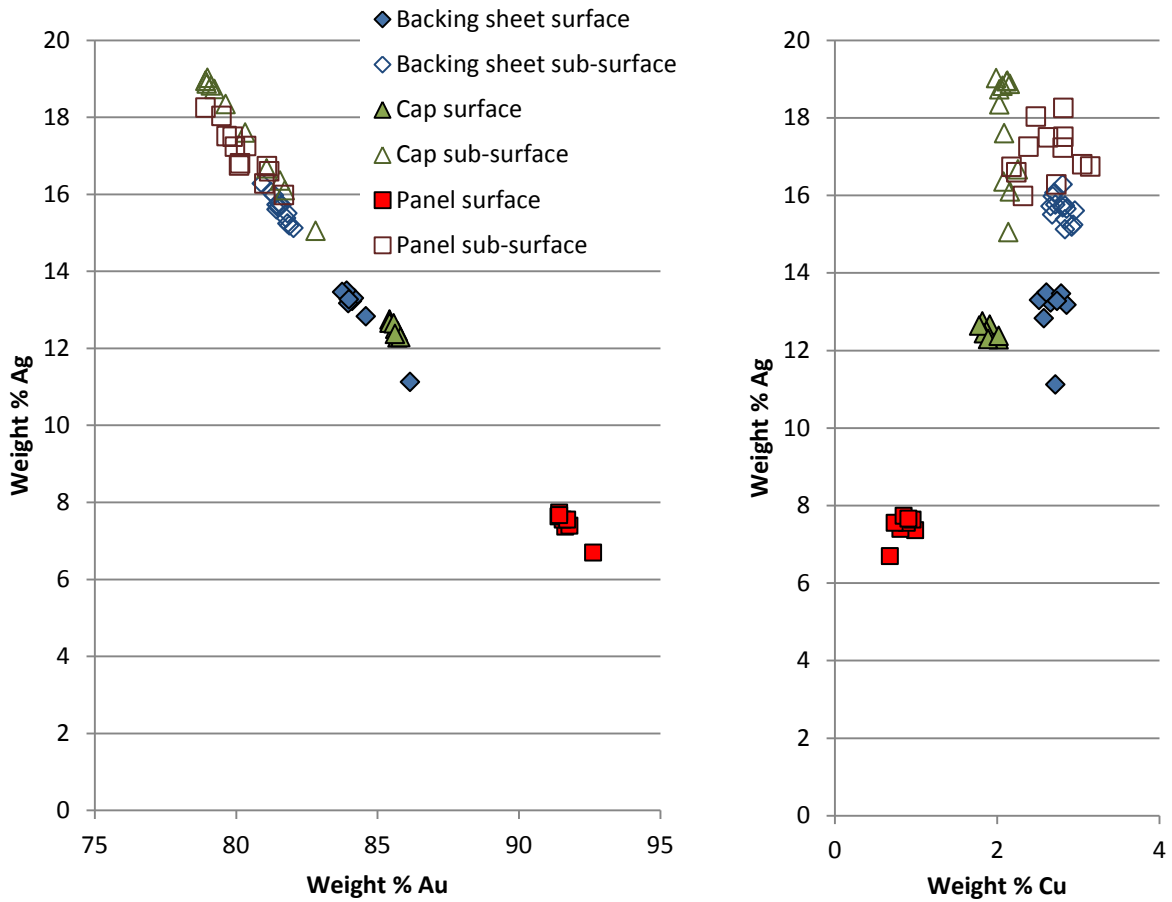
The analysis revealed a c.2.7 wt% loss of silver from the surface of the base sheet (a difference of c.17% from surface to core), which is indicative of treatment to deliberately enhance the gold colour of the metal. Only copper and small amounts of silver are normally lost from the surface during burial.

The sheet that formed the cap also had a c.5.3 wt% loss of silver from the surface of the base sheet (a difference of c.30% from surface to core). The inset panels revealed the biggest loss of silver (c.9.6 wt% loss of silver from the surface of the base sheet which was a difference of c. 56% from surface to core)

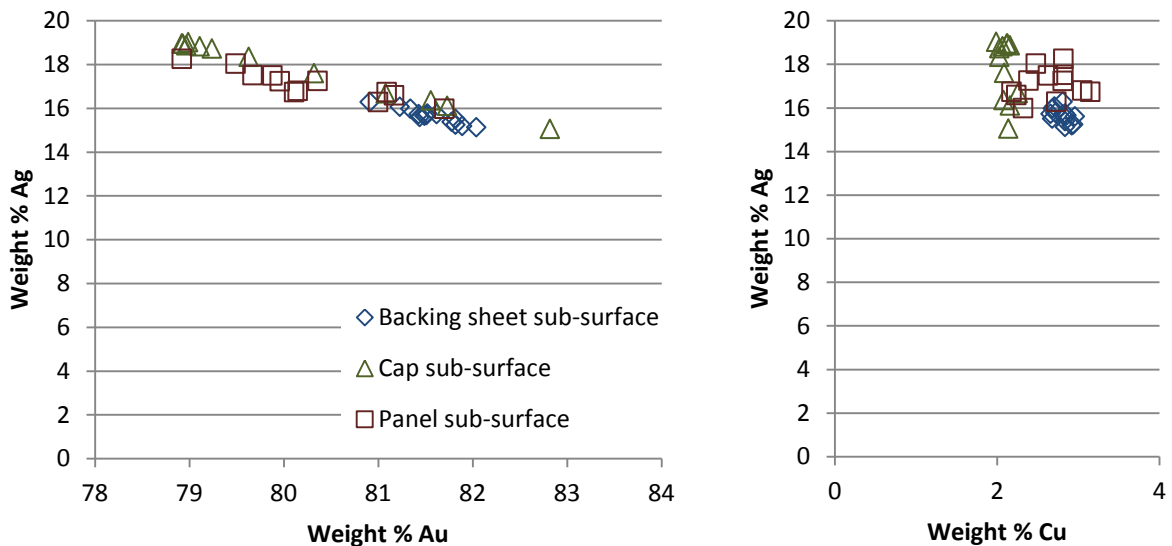
Comparison of the sub-surface compositions of each component suggests that all the components may have used the same, or a similar, gold alloy stock. All the sheets were enriched in gold, but to varying degrees, and therefore this suggests that the sheet was treated separately before being incorporated into the pommel.

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SEM-EDX analysis of K352



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.



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

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Analysed January 2014

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