

Gold enrichment in Staffordshire Hoard K697: results of SEM-EDX analysis

Object Type Pommel
Date 620-650

Decoration Filigree Glass
Garnet Other

SEM-EDX analysis was undertaken on a range of components, including the filigree wire, the separate cap and the base sheet to which the wires and cap were attached.



Area analysed	No of analyses	Wt%			
		Au	Ag	Cu	
Base sheet surface	8	Average	80.8	17.0	2.2
		Standard Deviation	1.14	1.15	0.15
Base sheet sub-surface	12	Average	70.4	26.2	3.4
		Standard Deviation	1.24	1.28	0.43
Top of cap surface	8	Average	76.9	19.5	3.6
		Standard Deviation	1.03	1.03	0.22
Top of cap sub-surface	12	Average	77.9	18.5	3.6
		Standard Deviation	0.75	0.55	0.28
Wire surface	6	Average	76.4	20.4	3.2
		Standard Deviation	2.67	2.59	0.29
Wire sub-surface	10	Average	73.8	23.7	2.5
		Standard Deviation	0.18	0.31	0.19

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

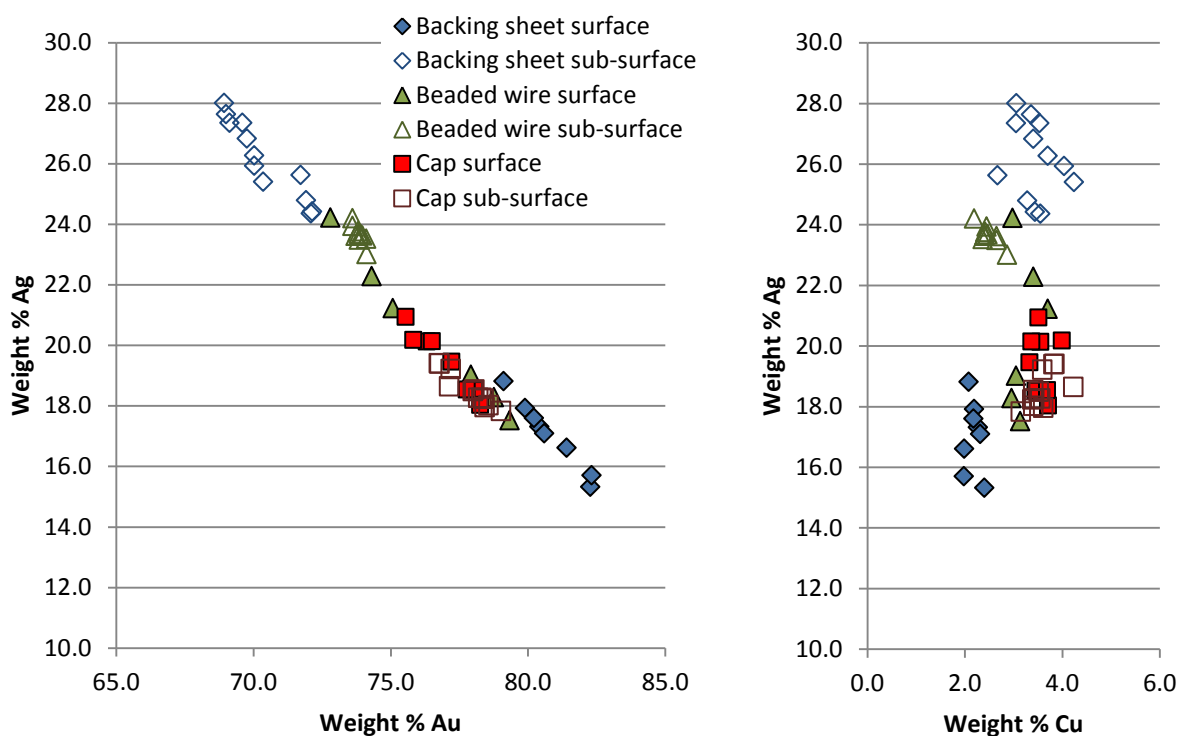
The analysis revealed a c.9.1 wt% loss of silver from the surface of the base sheet (a difference of c.35% from surface to core), which is indicative of treatment to deliberately enhance the gold colour of the metal. Only copper and small amounts of silver are normally lost from the surface during burial.

The analysis of the beaded wire revealed a c.3.2 wt% loss of silver from the surface of the base sheet (a difference of c.14% from surface to core), suggesting treatment to deliberately enhance the gold colour of the metal. The cap had no loss of copper and an increase of silver at the surface which is most likely from close contact to corroding silver objects in the burial environment or contamination from the solder used.

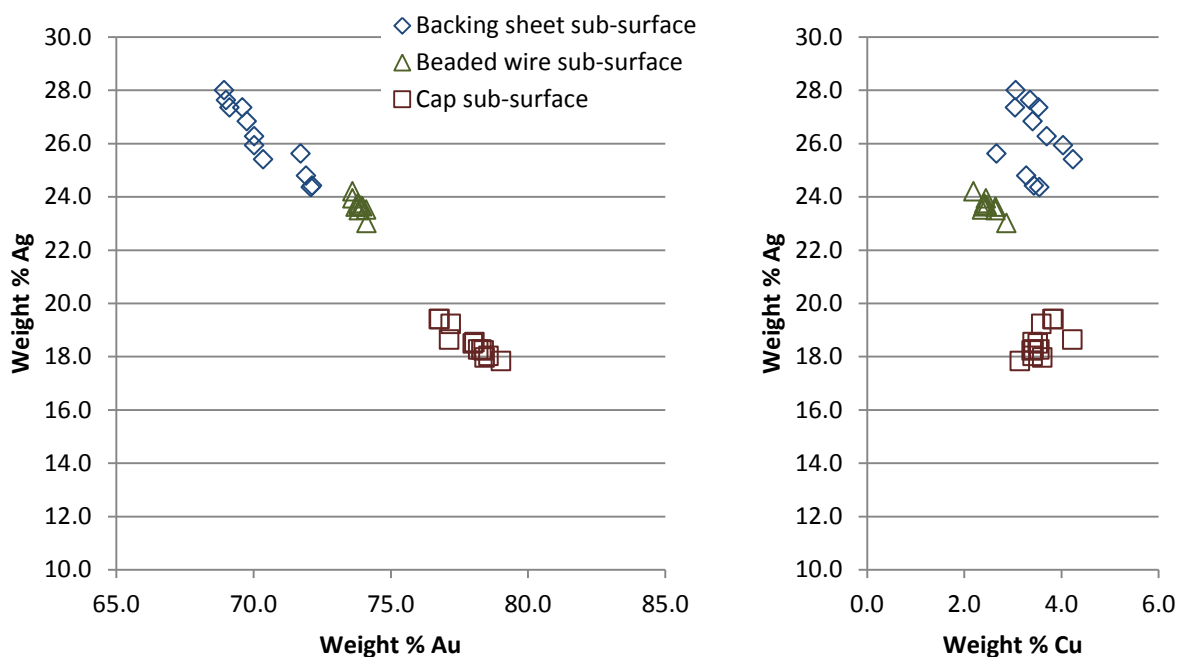
Comparison of the sub-surface compositions revealed that each component was made of a distinct gold alloy.

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SEM-EDX analysis of K697



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.

Eleanor Blakelock
Analysed January 2014

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