Gold enrichment in Staffordshire Hoard K673: results of SEM-EDX analysis

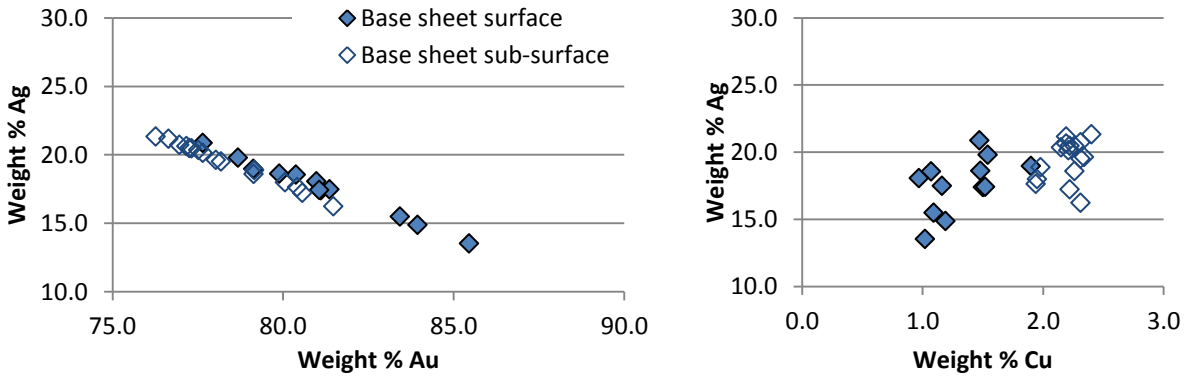
Object Type Mount
Date 600-630

Decoration
Filigree ✓ Glass
Garnet ✓ Other

SEM-EDX analysis was undertaken on a range of components, including two types of cell wall, filigree wire and the base sheet to which the wires and cell walls were attached.

Area analysed	No of analyses		Wt% Au	Wt% Ag	Wt% Cu
Base sheet surface	12	Average	81.1	17.6	1.3
		Standard Deviation	*2.26*	*2.09*	*0.28*
Base sheet sub-surface	16	Average	78.4	19.4	2.2
		Standard Deviation	*1.58*	*1.52*	*0.14*
Filigree wire surface	4	Average	72.8	24.9	2.3
		Standard Deviation	*2.35*	*2.57*	*0.21*
Filigree wire sub-surface	17	Average	75.2	22.5	2.3
		Standard Deviation	*0.90*	*0.90*	*0.09*
Thick cell wall surface	8	Average	75.8	22.1	2.1
		Standard Deviation	*0.83*	*0.89*	*0.08*
Thick cell wall sub-surface	16	Average	78.7	19.0	2.3
		Standard Deviation	*0.81*	*0.84*	*0.11*
Thin cell wall surface	8	Average	76.9	21.0	2.1
		Standard Deviation	*0.30*	*0.17*	*0.19*
Thin cell wall sub-surface	16	Average	77.8	19.9	2.3
		Standard Deviation	*0.40*	*0.38*	*0.12*

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

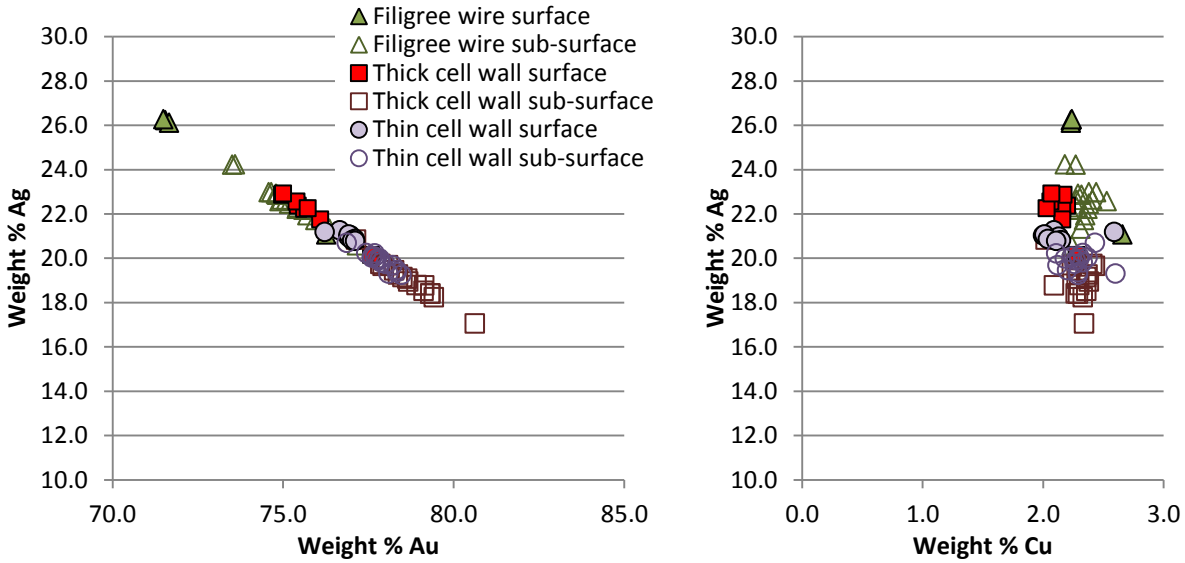


Plots of gold *vs* silver and copper *vs* silver contents, based on SEM-EDX analysis, showing the differences between the sub-surface and surface analyses for the base sheet.

The analysis of the backing sheet revealed a *c*.1.8 wt% loss of silver from the surface (a difference of *c*.10% from surface to core), which is indicative of treatment to deliberately

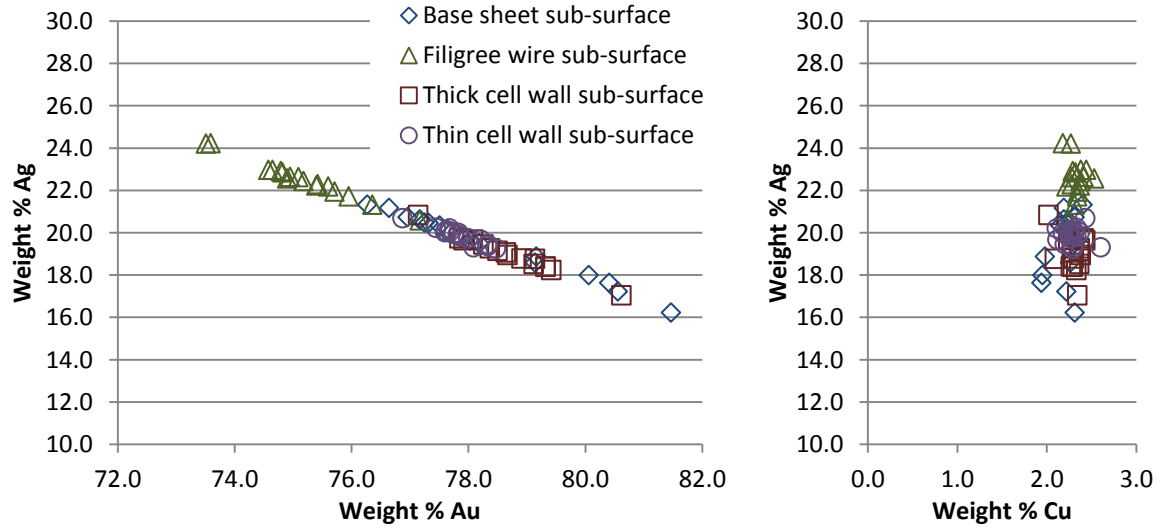
enrich the gold colour of the metal. Only copper and small amounts of silver are normally lost from the surface during burial.

The analysis of the other components revealed a loss of copper from the surface, most likely indicative of corrosion that can occur during burial which results in natural surface enrichment. They all had a slight increase in silver which may be due to the solder used to attach them to the gold backing sheet.



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 of all the other components.

Comparison of the sub-surface compositions of each component suggests that the majority of the components were made with the same, or a similar, gold alloy. The possible exception is the filigree wire which had a generally higher copper and silver content.



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 September 2013