Gold enrichment in Staffordshire Hoard K855: results of SEM-EDX analysis

Object Type   Hilt-collar
Date   610-630

Decoration   Filigree   [✓]   Glass   [ ]
   Garnet   [ ]   Other   [ ]

SEM-EDX analysis was undertaken on the filigree wires and the base sheet to which the wires were attached.

Area analysed	No of analyses		Wt% Au	Wt% Ag	Wt% Cu
Backing sheet surface	8	Average	82.2	14.0	3.8
		Standard Deviation	*1.16*	*1.21*	*0.68*
Backing sheet sub-surface	12	Average	69.4	28.0	2.6
		Standard Deviation	*2.06*	*2.23*	*0.49*
Filigree wire surface	7	Average	67.3	30.4	2.3
		Standard Deviation	*1.09*	*1.11*	*0.08*
Filigree wire sub-surface	9	Average	66.5	31.3	2.2
		Standard Deviation	*1.13*	*1.15*	*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
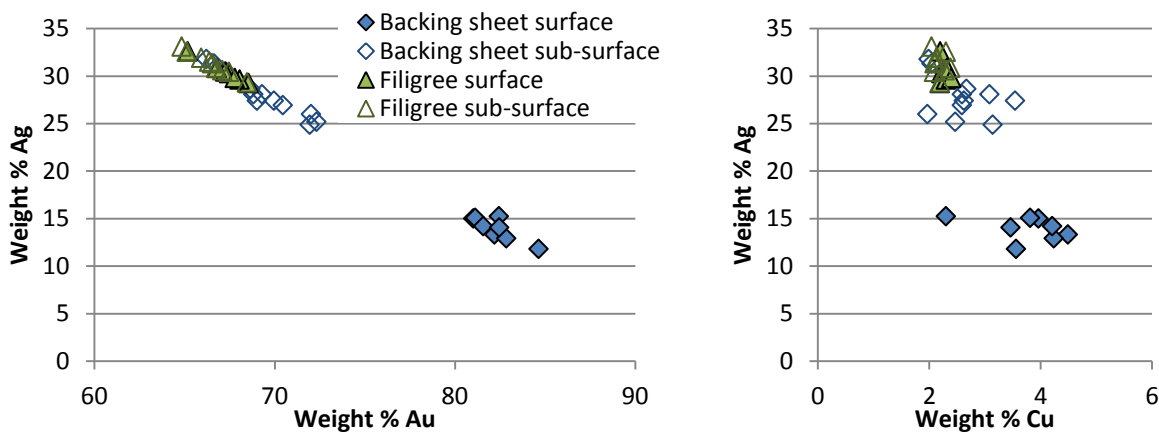
Plots of gold *vs* silver and copper *vs* silver contents, based on SEM-EDX analysis, showing the differences between the sub-surface and surface analyses.

The sub-surface composition of both components is similar suggesting a similar gold alloy was used. The analysis revealed a *c*.14.1 wt% loss of silver from the surface of the base sheet (a difference of *c*.50% 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 wire revealed a loss of copper and only a small loss of silver from the surface, most likely indicative of corrosion that can occur during burial which results in natural surface enrichment.

Eleanor Blakelock
Analysed December 2013