

Gold enrichment in Staffordshire Hoard K356: results of SEM-EDX analysis

Object Type Mount
Date 600-635
Decoration Filigree Glass
Garnet Other



SEM-EDX analysis was undertaken on a range of components, including the sheet used to construct the border, the side sheet, two types of filigree wire and a cell wall.

Area analysed	No of analyses		Wt% Au	Wt% Ag	Wt% Cu
Edge wall sheet surface	8	Average	78.2	20.3	1.5
		Standard Deviation	2.97	3.07	0.11
Edge wall sheet sub-surface	13	Average	81.4	16.9	1.7
		Standard Deviation	2.16	2.27	0.12
Side sheet surface	12	Average	72.3	26.2	1.5
		Standard Deviation	2.89	2.94	0.11
Side sheet sub-surface	14	Average	81.7	16.6	1.7
		Standard Deviation	0.56	0.59	0.07
Cell wall surface	8	Average	76.5	20.1	3.4
		Standard Deviation	0.94	1.68	1.23
Cell wall sub-surface	12	Average	80.3	16.0	3.7
		Standard Deviation	0.44	0.56	0.72
Filigree wire surface	8	Average	75.7	22.7	1.6
		Standard Deviation	3.50	3.79	0.33
Filigree wire sub-surface	8	Average	82.7	15.3	2.0
		Standard Deviation	1.00	0.99	0.10
Border filigree wire surface	2	Average	79.7	18.6	1.7
		Standard Deviation	0.13	0.04	0.09
Border filigree wire sub-surface	4	Average	80.7	17.5	1.8
		Standard Deviation	0.13	0.18	0.06

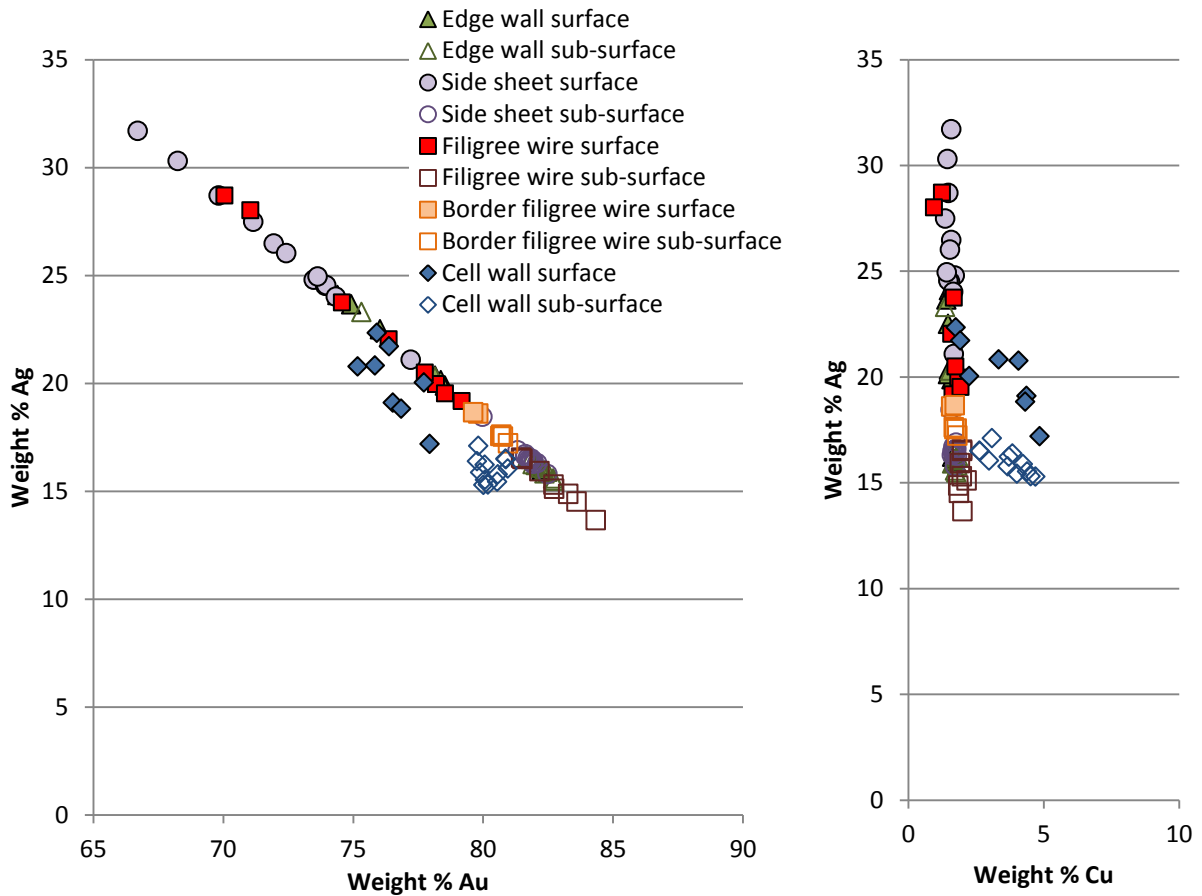
SEM-EDX surface and sub-surface compositions for each component analysed (the results are normalised). This analysis was carried out as part of the gold enrichment study. For full details of methodology and associated results see report PR07444-10 and PR07444-15

The analysis revealed a small loss of copper on the surface of all components analysed, most likely indicative of corrosion that can occur during burial which results in natural surface enrichment. There was a small increase in silver at the surface of all the components which is most likely from close contact with corroding silver objects in the burial environment.

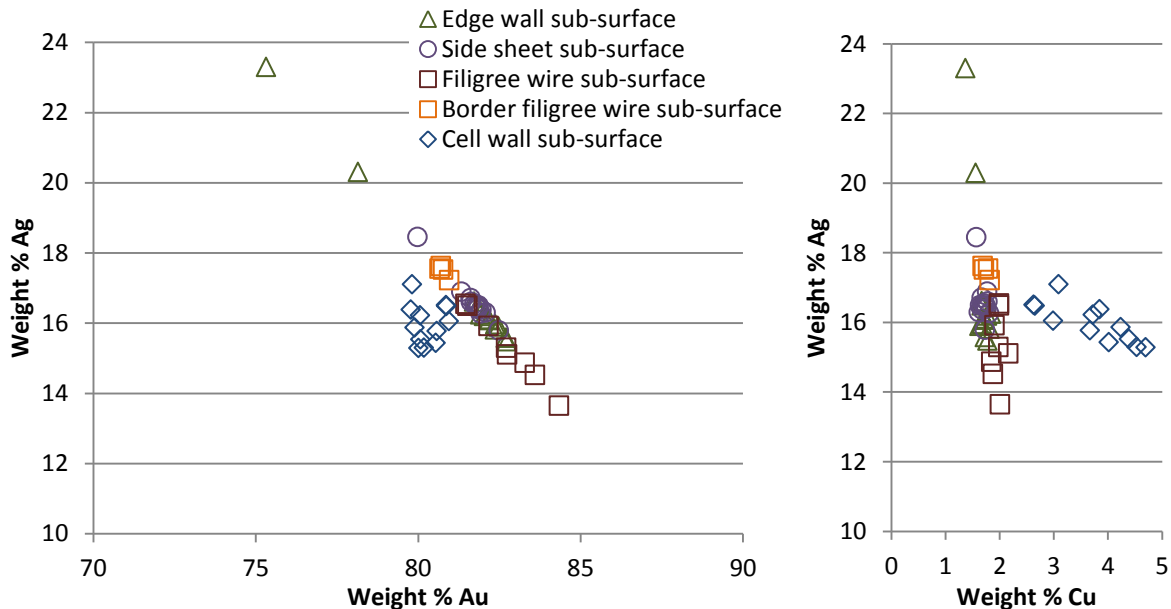
Comparison of the sub-surface compositions of each component suggests that the majority of the components may have used the same, or a similar, gold alloy. The exception is the cell wall which had a distinctly higher copper content.

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SEM-EDX analysis of K356



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 November 2013

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