

Gold enrichment in Staffordshire Hoard K659: results of SEM-EDX analysis

Object Type Gem setting for cross
Date 630-670

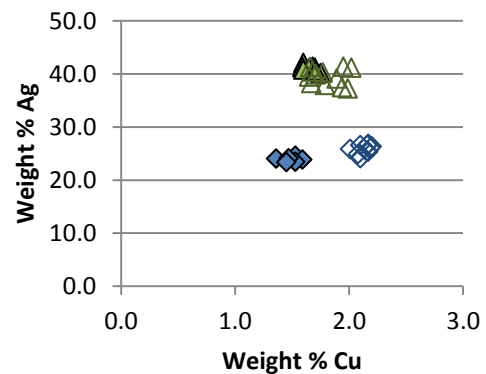
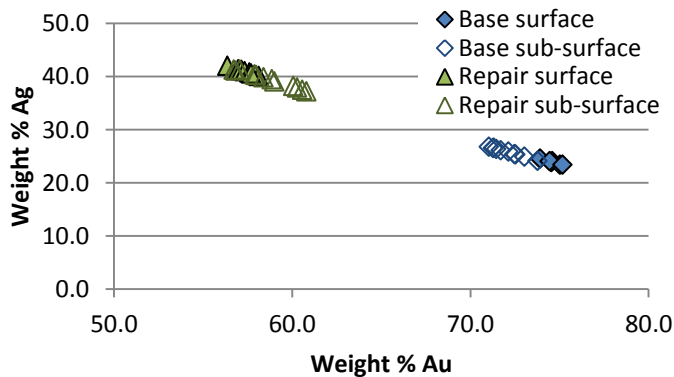
Decoration Filigree Glass
Garnet Other



SEM-EDX analysis was undertaken on the back of the sheet of the gem setting and the metal used to repair and fix the garnet.

Area analysed	No of analyses		Wt% Au	Wt% Ag	Wt% Cu
Base surface	10	Average	74.6	23.9	1.5
		Standard Deviation	0.45	0.44	0.08
Base sub-surface	14	Average	72.1	25.8	2.1
		Standard Deviation	0.88	0.86	0.06
Repair surface	8	Average	57.3	41.0	1.7
		Standard Deviation	0.53	0.57	0.06
Repair sub-surface	12	Average	58.7	39.5	1.8
		Standard Deviation	1.47	1.48	0.14

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 analysis revealed a c.1.9 wt% loss of silver from the surface (a difference of c.7% from surface to core), which is most likely indicative of corrosion that can occur during burial which results in natural surface enrichment but could also be the result of some deliberate surface treatment.

The metal used to repair the garnet fitting had a much higher silver content, and there was also more silver detected on the surface which is most likely contamination from solder or from close contact with corroding silver objects in the burial environment.

Eleanor Blakelock
Analysed November 2013

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