

Gold enrichment in Staffordshire Hoard K690: results of SEM-EDX analysis

Object Type Hilt-ring
Date 620-650

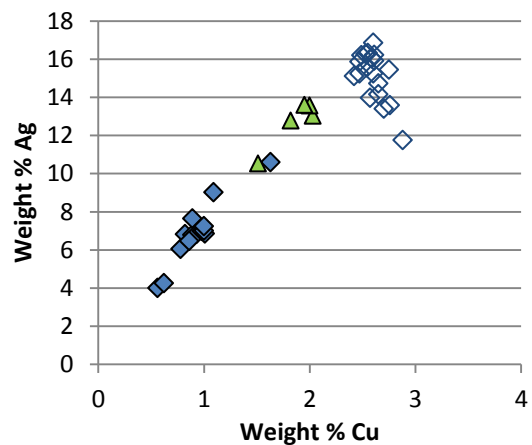
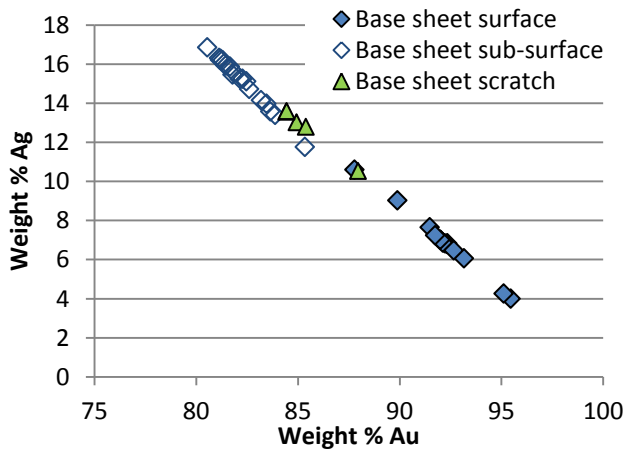
Decoration Filigree Glass
Garnet Other



SEM-EDX analysis was undertaken on the base of the hilt-ring which is part of a set of fittings from a seax handle.

| Area analysed | No of analyses | | Wt% Au | Wt% Ag | Wt% Cu |
|---------------|----------------|--------------------|--------|--------|--------|
| Surface | 14 | Average | 92.2 | 6.9 | 0.9 |
| | | Standard Deviation | 1.88 | 1.65 | 0.25 |
| Scratch | 5 | Average | 85.4 | 12.7 | 1.9 |
| | | Standard Deviation | 1.46 | 1.26 | 0.21 |
| Sub-surface | 19 | Average | 82.2 | 15.2 | 2.6 |
| | | Standard Deviation | 1.21 | 1.28 | 0.11 |

SEM-EDX surface and sub-surface compositions (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.

SEM-EDX analysis of the sub-surface indicated a surface composition of approximately 81-84 wt% gold, 14-17 wt% silver, the rest being copper. The analysis revealed a c.8.3 wt% loss of silver from the surface (a difference of c.54% 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 surface of the scratch had a similar composition to the subsurface, but with a similar loss in copper to the other surface analyses, most likely due to corrosion, confirming that the treatment was carried out prior to burial.

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Analysed August 2013

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