

**Gold enrichment in Staffordshire Hoard K714: results of SEM-EDX analysis**

Object Type Pommel  
Date 610-630

Decoration Filigree  Glass   
Garnet  Other

SEM-EDX analysis was undertaken on a number of components, including the sheet that was used as a base for the filigree, the large filigree wire and small filigree wire.



| Area analysed                   | No of analyses |                    | Wt% Au | Wt% Ag | Wt% Cu |
|---------------------------------|----------------|--------------------|--------|--------|--------|
| Base sheet surface              | 8              | Average            | 84.0   | 14.6   | 1.4    |
|                                 |                | Standard Deviation | 1.03   | 0.93   | 0.13   |
| Base sheet sub-surface          | 12             | Average            | 79.5   | 17.9   | 2.6    |
|                                 |                | Standard Deviation | 1.30   | 0.99   | 0.39   |
| Large filigree wire surface     | 8              | Average            | 80.0   | 18.0   | 2.0    |
|                                 |                | Standard Deviation | 0.31   | 0.38   | 0.12   |
| Large filigree wire sub-surface | 12             | Average            | 82.6   | 15.5   | 1.9    |
|                                 |                | Standard Deviation | 1.41   | 1.29   | 0.19   |
| Small filigree wire surface     | 8              | Average            | 83.3   | 15.0   | 1.7    |
|                                 |                | Standard Deviation | 2.49   | 2.19   | 0.37   |
| Small filigree wire sub-surface | 12             | Average            | 83.3   | 14.8   | 1.9    |
|                                 |                | Standard Deviation | 0.99   | 0.91   | 0.18   |

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

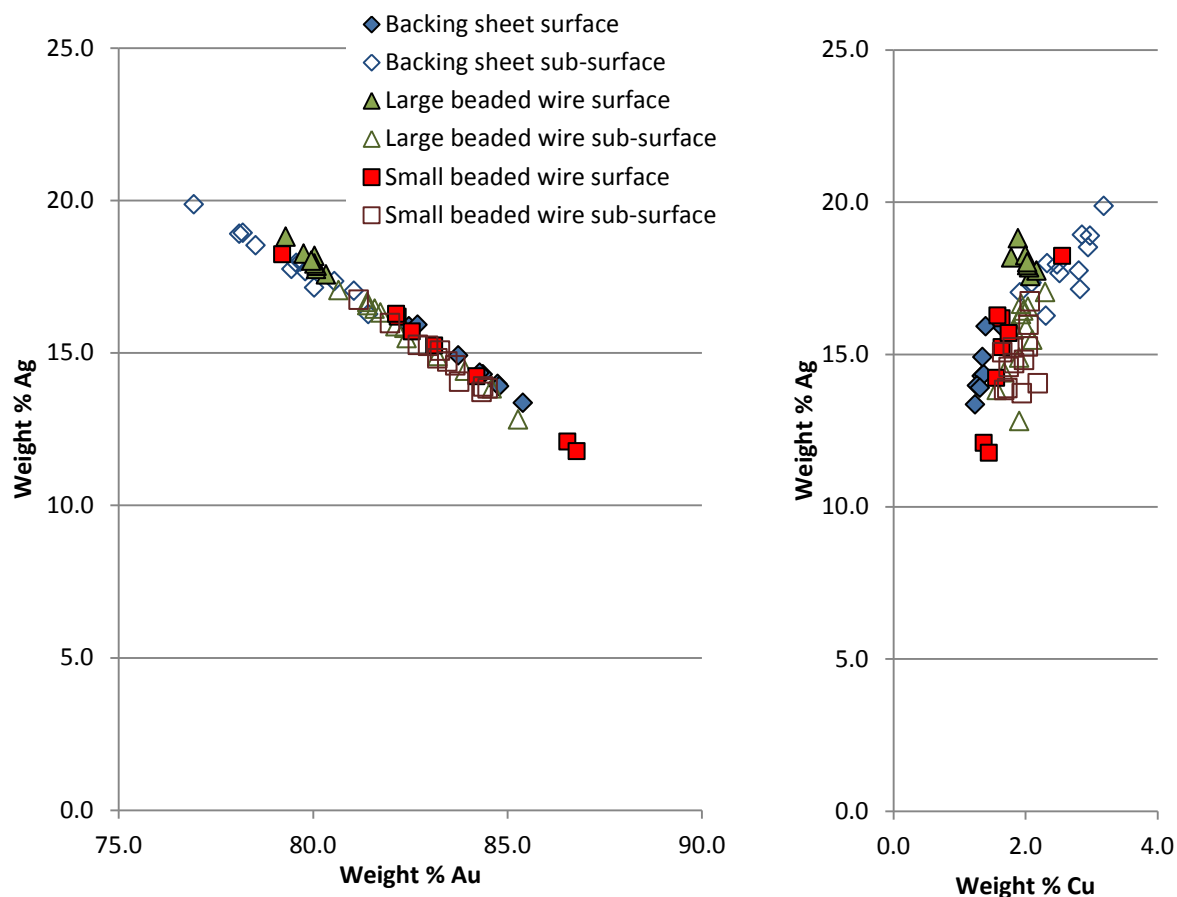
SEM-EDX analysis of the sub-surface of the base sheet indicated a composition of approximately 77-81 wt% gold, 17-19 wt% silver, the rest being copper. The analysis revealed a c.3.4 wt% loss of silver from the surface (a difference of c.19% from surface to core), which is indicative of treatment to deliberately enrich the gold colour of the metal. Only copper and small amounts of silver are normally lost from the surface during burial.

The analysis revealed no, or a small, loss of copper at the surface of the wires, most likely indicative of corrosion that can occur during burial which results in natural surface enrichment. There was also a small increase in silver at the surface which is most likely from close contact to corroding silver objects in the burial environment.

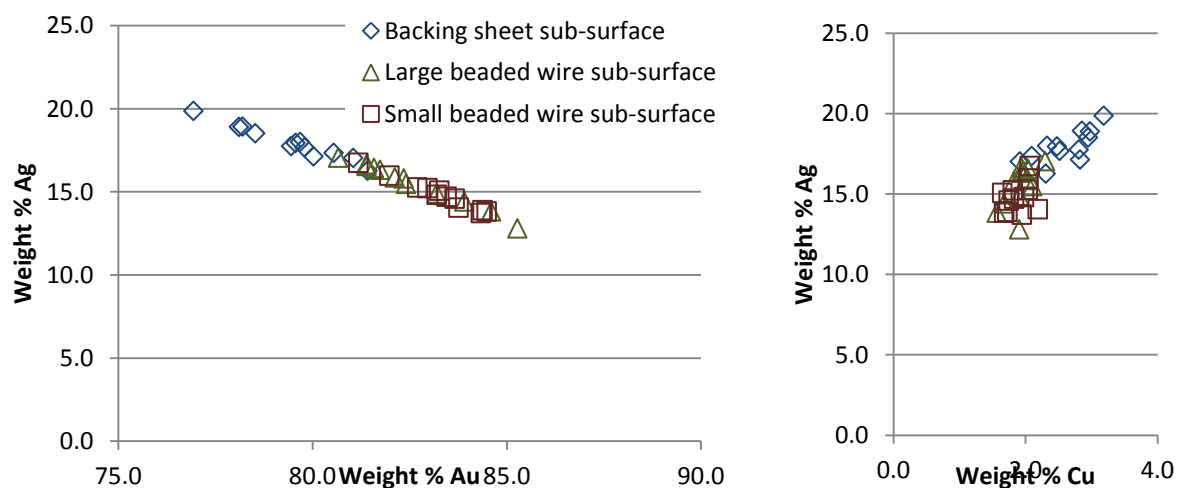
Comparison of the sub-surface compositions suggests that the beaded wires were probably made from the same gold alloy. The backing sheet however was more distinctive but was still a similar gold alloy.

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# SEM-EDX analysis of K714



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.

Eleanor Blakelock  
Analysed January 2014

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