

SEM-EDX Analytical Data from Benvenuto Cellinis Salt Cellar “Saliera”

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Keywords: EDX, Enamel, Renaissance, Forensic, Saliera

Cellini's Saliera is one of the most magnificent peaces of renaissance art. It was stolen from its display at the museum of fine arts in Vienna (Kunsthistorisches Museum – KHM) in 2003. Several hundreds of confession letters were received after the theft. In many of them attempts to blackmail the assurance company were made, i.e. the writers threatened to destroy this unique peace of art.

One main line of investigation was to find out which of these blackmail letters was authentic. Consequently, the thief was asked to prove the justification of his request for ransom. In one of the following letters, blue particles, said to be derived from the enamel of the Saliera were included. These fragments were compared with similar splinters that originated from the KHM using micro-spectrometry (diode array microspectrometer MCS on a Reichert Polyvar microscope) and energy-dispersive X-ray microanalysis in a scanning electron microscope (Oxford Link Isis EDX on a Zeiss DSM 960A microscope) without conductive coating.

The spectra of the colors of the splinters from the blackmail letter and the particles from the KHM showed excellent matching, both with transmission maxima of 640nm.

The elemental composition \geq Na in the EDX was rather variable between the different measurements and objects (Fig. 1), see [1] for details. However, this is a feature that is probably derived from differences in the raw materials, impurities and manufacturing. Certain elements like lead or chromium are characteristically absent or low level in pre-1800 enamels [2]. Consequently, it was assumed that both samples of enamel fragments may have the same source, i.e., that the specific blackmail letter was authentic.

In a later step in the negotiations, the thief submitted the trident of the statue of Poseidon from the cellar as a further proof. Analogous EDX analysis of the enamel and also of the gold body (Fig. 2) of the trident revealed no major differences in elemental composition (and that the gold of the trident is of high purity with only traces of copper).

The results of these analyses helped the police investigators to sort out the numerous fake confession letters and to concentrate their persecution on the real thief – who was arrested soon after and sentenced to five years in prison.

1. H. Ditrich, Arch.f.Kriminol. 223 (2009)
2. S. Röhrs, Diss. TU Berlin, D83 (2004)
3. Thanks to CI Dipl.-HTL-Ing. Bettina Bogner for micro-spectrogrammetry. The kind support from the experts of the KHM – Ms. Dr. Griesser, Ms. Mag. Hanzer and Ms. Mag. Dr. Uhlir is gratefully acknowledged.

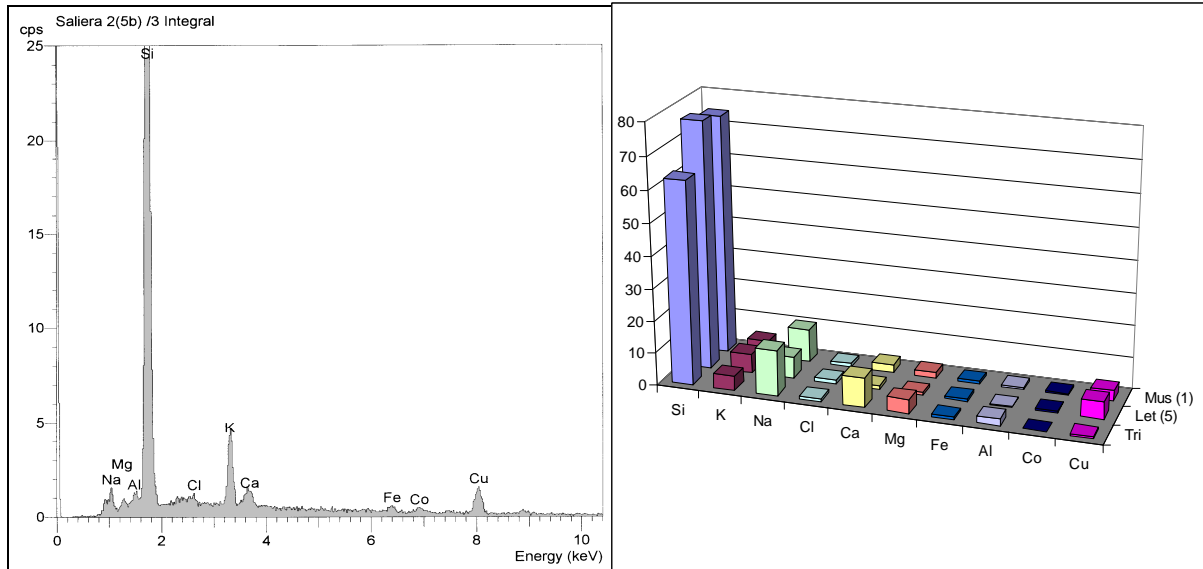


Figure 1. EDX-spectrum from a fragment from the Saliera (left) and average percentage of the detected elements (\geq Na) from the enamel fragments from KHM (Mus), blackmail letter (Let) and the trident (Tri) (right). Note that the elements Cr or Pb are absent in all samples.



Figure 2. Trident of the Poseidon figure from the Saliera. The numbers indicate the positions for analysis (1 – gold body, 2-4 – enamel).