



ACCELERATOR-BASED TECHNIQUES FOR THE DETECTION OF FORGERIES IN THE FIELD OF CULTURAL HERITAGE

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Forgeries have existed in many fields. Money, goods, artworks have been imitated since centuries to deceive and make profit. In this talk, I will present cases where nuclear analytical methods have been used to study past and recent forgeries in the field of Cultural Heritage.

The first example will deal with ancient counterfeit coins. Long considered uninteresting by numismatists, counterfeit coins are nevertheless archeological evidence of ancient metallurgy technologies as well as counterfeiting practices. Many techniques were used to fool customers with false coins representing circulating coins. One of them was the use of cheaper metals than those of the official production, while respecting the visual aspect - color, engraving, size - as well as the weight which was directly connected to the value of the coinage. Silver coinage was imitated in the past by replacing silver, partly or entirely, by copper or iron and the visual silvery surface was produced by various manufacturing processes. The technology of the unofficial production of silvered coins was investigated by using fast neutron activation analysis and PIXE for the non-destructive and quantitative determination of the metal content and by Rutherford backscattering spectrometry (RBS) for the surface analysis. The silvering processes used for silver-plated coin forgeries of the 3rd and the 16th centuries will be described.

The second example will deal with recent art forgeries. Investigations to authenticate paintings rely on an advanced knowledge of art history and a collection of scientific techniques. However, accelerator mass spectrometry (AMS) radiocarbon (^{14}C) dating is the only technique that gives access to an absolute time scale. AMS radiocarbon dating was applied to paintings of the 20th century to identify potential forgeries in the context of an ongoing police investigation. ^{14}C measurements show that the plants used to make the canvas were harvested after 1955, that is to say at least 10 years after the death in the 40s of the supposed artists. These results demonstrate that the paintings are recent forgeries.

Finally, the new attribution of the Flora bust of the Bode-Museum recently ^{14}C AMS dated will be presented.