

## News &amp; Comments

## Ion Beam Analysis to Identify Ancient and Recent Art Forgeries

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The fraudulent imitation of a valued product with the purpose to mislead is called counterfeiting. Forgery of money or documents, imitation of goods like apparel, pharmaceuticals, auto and aviation components, food, electronics, watches, and works of art are just a few examples of this unlawful practice. Since the appearance of forgeries is typically very similar to that of genuine products, one of the biggest challenges for experts is to identify or date the material used to produce them. These inquiries must be as non-intrusive as feasible when dealing with real or allegedly real cultural heritage objects. The development of nuclear techniques for studying art and archaeology in recent decades—derived from low-energy accelerators—has opened the door for new approaches to assess and authenticate cultural heritage artefacts.

For a variety of reasons, it is relatively uncommon to find counterfeit coins. First off, when fake coins were saved in the past, collectors did not pay much attention to them because they were not frequently retained as jewels by private individuals. Additionally, rust and the often-subpar quality of the imitations hinder effective preservation. The paint sample was just processed with acid due to its tiny size, while fibre and wood samples were pre-treated using acid-base-acid washes for radiocarbon dating. Samples were vacuum-dried at 60 °C before being put in quartz tubes with extra CuO and Ag. A thin silver foil can be coated with pure silver to apply it, or it can be replaced electrochemically. Since they require little intervention, ion beam analysis (IBA) and  $^{14}\text{C}$  accelerator mass spectrometry (AMS) are the preferred techniques for examining ancient artefacts and works of art. The study of forgery and counterfeiting in the arts can benefit from the use of both methodologies. The study of the metallurgical procedures used to create silver counterfeit coins in the 16th century revealed the existence of 14 coins that had been silvered with mercury. Given that there are so few known examples from before the 17th century, this discovery is significant. Radiocarbon dating was done on five paintings. It was clearly shown, using the bomb peak calibration curve, that three paintings, purportedly from the turn of the 20th century, are fakes created after 1956.

**JOURNAL REFERENCE**

Beck L. Ion Beam Analysis and  $^{14}\text{C}$  Accelerator Mass Spectroscopy to Identify Ancient and Recent Art Forgeries. [Physics. 2022; 4\(2\):462-472.](#)

**KEYWORDS**

Ion beam analysis (IBA),  $^{14}\text{C}$  accelerator mass spectroscopy (AMS), forgeries, silver coins

