How rhodium plating can affect gold XRF results

Thermo Scientific™ Niton™ XRF Analyzers can help precious metals professionals detect rhodium (Rh) plating and interpret gold (Au) results with confidence.

Seeing lower-than-expected Au results on white gold? Check for Rh plating.

The challenge

Rhodium plating is widely used to create a bright white, highly reflective finish on gold jewelry, especially items made of white gold. But because the typical method for evaluating jewelry's precious metal content, X-ray fluorescence (XRF) spectrometry, measures the surface and near-surface composition of the metal, a rhodium-plated surface can influence the displayed gold result.

In practical terms, this means some items made of white gold may appear to read slightly or even significantly lower in gold content if the item is plated with a coating of rhodium.

Plating's impact on reported gold concentration

Rhodium at the surface can affect how the underlying gold alloy is measured and reported: The thicker the plating, the greater the potential effect on the reported Au result.
A lower-than-expected Au result on a Rh-plated item does not automatically mean the item is truly made of lower-karat gold.

The effect of plating thickness

Plating thickness can vary by item, manufacturer, repair history, and refinishing process. A very thin Rh layer may have only a small impact on the measured gold concentration (less than one percent), while heavier or repeated plating will have a more noticeable impact on the Au content measurement as determined by XRF.

Recognize rhodium plating during analysis

Thermo Scientific Niton XRF Analyzers are able to detect the presence of rhodium on the surface of plated jewelry.
That extra context—knowing that Rh is present—can help the operator understand why an Au result may not match the expected karat value.

Benefits of XRF in jewelry analysis

Niton XRF analyzers provide capabilities that can enhance a jeweler's operations in several ways:

- Identify Rh-plated gold items during routine testing
- Reduce confusion around unexpected Au readings
- Support more confident buying, selling, refining, and verification decisions
- Help explain results to customers, suppliers, and trading partners

Reduce risk in precious metals trading

In precious metals trading, small differences in reported gold concentration can affect pricing, settlement, customer trust, and supplier relationships. Recognizing Rh plating helps users avoid unnecessary disputes, retesting, or destructive testing when the surface finish is influencing the measurement.

Best practices

One should always check the result for Rh when Au appears lower than expected.

- Test multiple locations, especially where plating may vary
- Look for worn or unplated areas when appropriate
- Interpret Au results in the context of surface finish and item history
- If appropriate, remove the rhodium plating prior to XRF analysis to evaluate the underlying alloy

The bottom line

Rhodium plating can make a properly karated gold item appear to return a lower Au result when it is evaluated by XRF. Niton XRF analyzers can detect Rh at the surface, helping precious metals professionals recognize plating, interpret results correctly, and make more confident decisions.

Learn how Niton XRF analyzers help identify plating, verify alloys, and protect confidence in precious metals transactions at **thermofisher.com/preciousmetals**

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