



September 3, 2014

Project 14.999

Local Jewelry Company
123 Main Street
Anywhere, USA 45678

Attn: James Smith
Phone: 555-555-1234
Email: jsmith@localjewels.com

Failure Analysis

This report contains the results of the failure analysis of a tarnished gold sample submitted August 29, 2014 by James Smith.

LCM Sample ID	Client Sample ID	Sample Results (% weight)	14k Yellow Gold Literature Values (% weight)
14.999-01	Gold Chain "14k Gold"	Au: ~ 27.6% Ag: ~ 2.6% Cu: ~ 62.5% Zn: ~ 7.2%	Au: 58.5% Ag: 4% Cu: 31.2% Zn: 6.3%

Comment

The sample was analyzed by Amptek X-Ray Fluorescence (XRF). XRF analysis revealed the sample to be a closer match to 7k gold (about half as much gold as expected in 14k). Density was measured to be roughly 11 g/cm³ which is consistent with the metal percentages determined by XRF.

The high copper content is likely responsible for the tarnishing. A single link was cut to check for consistency throughout the sample (Figure 1). No plating or discrepancies in homogeneity were detected.



Figure 1: Check for Gold Plating. A single link was cut to check for possible differences between the core and exterior of the sample. Color is consistent throughout the sample.

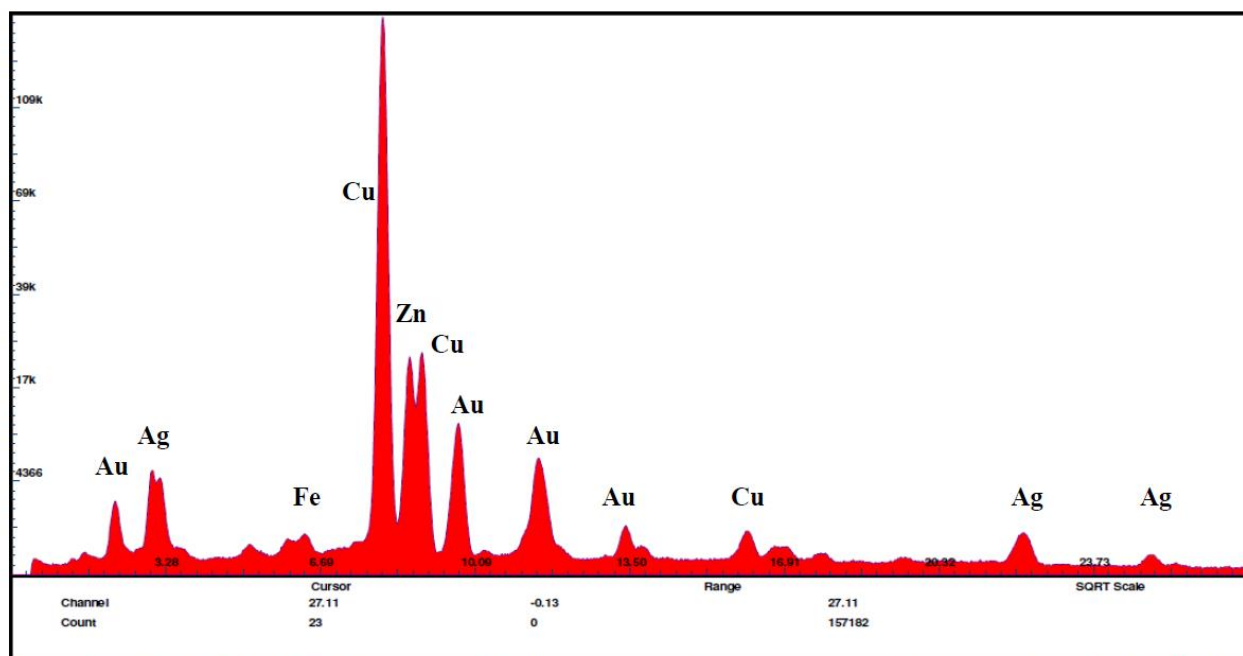


Figure 2: Gold Chain XRF Response. XRF spectrum of the submitted gold chain with peaks labelled.



**The results presented in this report relate only to the samples tested.
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Test Conductor

Certifying Manager

Scientist

Chief Materials Chemist

810 NW 45th Street • Seattle, Washington 98107
Phone: (206) 508-1470 • E-mail: mail@labcornmaterials.com