



## Colorado Science and Engineering Fair

## 2024 Individual Project Abstract Form

**Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.**

Title of Project: Effects of Acids on Alloy Metals of Costume Jewelry - A Way to Improve Appearance

Finalist's Name: Katelyn Marquez

School and City: Miami Yoder High School, CO Yoder

Sponsor's Name: Angie Grimes

Category: Chemistry (CHEM)

Division: Senior (9th - 12th grades)

Abstract (250 words or less):

The purpose of my experiment was to test if low molarity acids (.5M) would restore metal costume jewelry to a shiny condition. I soaked three different types of metal chains for one minute in each acid in order to test immediate results and found that there was very little effect from any of the acids in this short time frame. However, after 30 minutes soaking in each of the solutions, I found that the citric and acetic acids had beneficial results and scored them both a 4 on my rating scale. Two of the acids, Hydrochloric and nitric, actually made the metal chains look worse. I rated the hydrochloric acid effect at a zero on my scale, but I needed a negative score to indicate it was far worse than the control.

My hypothesis was not supported because I thought all the acids would have some kind of beneficial effect. The visual data was not the best way to record results since it was a subjective opinion of "shininess". A better way to record effectiveness may be to have a single chain and have only half of the chain submerged in the acid, so the results can be observed right next to each other, rather than go back and forth between pictures of "before and after". I would also like to extend the research to see if additional methods such as abrasive scrubbing will improve the results.

*I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.*

Finalist's Signature:

Date: 3/4/24

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with you Finalist Verification/Permission Form. A signed copy of this form must be included in your notebook.