TACO SAUCE PENNY CLEANER

NOTICE THE DIFFERENCE!

Next:
Materials and Explanations

Then:
Step-by-Step Photo Sequence
TACO SAUCE PENNY CLEANER

It's one of those things you hear about but wonder if it's true. Can you use taco sauce to clean the tarnish off of a penny? Believe it or not, taco sauce does a great job of cleaning pennies, but how does it work? Which ingredients in the taco sauce really do the cleaning?

Materials
• Dirty pennies (try to collect tarnished pennies that all look the same)
• Taco sauce (mild sauce from Taco Bell works well)
• Vinegar
• Tomato paste
• Salt
• Water
• Small plates
• Masking tape or sticky note

EXPERIMENT
1. Let's start by proving that taco sauce does a good job of cleaning pennies. Place several tarnished pennies on a plate and cover them with taco sauce. Use your fingers to smear the taco sauce all over the surface of the pennies. Remember to wash your hands... and don't lick your fingers (pennies are really dirty and some taco sauces are really spicy!).
2. Allow the taco sauce to sit on the pennies for at least two minutes.
3. Rinse the pennies in the sink and look at the difference between the top side of the pennies that touched the taco sauce and the bottom side. It's no myth... taco sauce does the trick.
So, which ingredients are responsible for the cleaning power of taco sauce? Let’s find out...

1. Place two or three equally tarnished pennies on each of four plates. Use masking tape or a sticky note to mark each plate with the ingredient you are testing (vinegar, tomato paste, salt, and water).
2. Cover the pennies with the various ingredients and allow them to sit for at least two minutes.
3. Rinse the pennies from each test plate with water. Which ingredient cleaned the pennies the best?

Much to our surprise, none of the ingredients did a good job of cleaning the dirty pennies. In fact, the results were terrible. Where did we go wrong? Maybe two or more of the ingredients work together to react against the copper oxide on the penny. This assumption helped set up our second test using various combinations of tomato paste, vinegar, and salt.

1. Place two or three equally tarnished pennies on each of three plates. Make three signs that say "Tomato Paste + Vinegar," "Salt + Vinegar," and "Tomato Paste + Salt."
2. Cover the pennies with each of the mixtures and give the ingredients at least two minutes to react.
3. Rinse the pennies under water and write down your observations.

HOW DOES IT WORK?
The clear winner is the mixture of vinegar and salt. Neither vinegar nor salt by itself cleaned the pennies, but when they were mixed together something happened. The chemistry behind the reaction is somewhat complicated but very interesting. When the salt and the vinegar are mixed together, the salt dissolves in the vinegar solution and breaks down into sodium and chloride ions. The chloride ions then combine with the copper in the penny to remove the tarnish or copper oxide from the surface of the penny. It is also well known that a mixture of lemon juice and salt does a good job in removing tarnish from metals and works very well on pennies. By themselves, the salt and vinegar do very little in the way of removing the coating of copper oxide on the penny, but together these ingredients make a great cleaning agent. Now you know the cleaning power of taco sauce!
ADDITIONAL INFO
Science Fair Connection:
The Taco Sauce Penny Cleaner is a great example of a science fair project. First, you ask a question - does taco sauce really clean pennies? You find that it does and then you ask another question - What is it in the taco sauce that causes it to clean pennies? You run multiple tests and isolate one variable at a time to see if the vinegar, the tomato paste, the salt, or the water is the real cleaning agent for the pennies. Guess what... nothing cleans the penny. Now what do you do? You ask another question - Could a combination of ingredients cause the cleaning action? Again, you isolate the variables to eventually reach the conclusion that the combination of the vinegar and salt cleans the pennies.
Taco Sauce Penny Cleaner

Here is what you need

Taco Sauce
Dirty Pennies
A small plate
PUT A LITTLE TACO SAUCE ON ONE SIDE OF EACH PENNY

SPREAD IT OUT
LET THEM SIT FOR AWHILE

USE A PAPER TOWEL TO CLEAN THEM OFF
NOTICE THE DIFFERENCE!

WHAT MAKES THIS HAPPEN?

TRY CLEANING A PENNY USING THE INDIVIDUAL INGREDIENTS IN TACO SAUCE... CAN YOU DETERMINE WHAT THE CLEANING AGENT IS?