

## What's in your pocket? S&T prof explains fluctuating value of metal in coins

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Dr. Ronald Kohser has been keeping a close watch on coins during his career. According to Kohser, a professor of metallurgical engineering at Missouri University of Science and Technology, it currently costs the U.S. Mint about 1.7 cents to make a penny and around 7 or 8 cents to make a nickel. The amounts include metal content, tools and dies, and labor.

"The problem is when the value of the metal exceeds the face value of the coin," says Kohser, whose research interests include the cryogenic processing of metals, a process that modifies the microstructure of materials.

In 1964, the value of the quarter, which was 90 percent silver, exceeded the value of the coin. People started to melt down quarters for a profit. "The solution was to create a sandwich coin that contained a core of copper with a silver-appearing copper-nickel alloy on the outside," says Kohser, who adds that the same thing was done with dimes.

Today, the nickel is a concern. Here are the approximate current metal values of U.S. [coins](#) per coinflation.com (as of February):

- Penny: 0.54 cents
- Nickel: 5.63 cents
- Dime: 2.11 cents
- Quarter: 5.29 cents

The penny has gone through several changes in constitution, according to Kohser. Shortly after [World War II](#), pennies were minted from spent shell casings. For a while in the 1970s, the U.S. Mint began making pennies out of aluminum, but that idea was scrapped for various reasons. In 1982, the penny was changed to its current configuration of copper-plated zinc, resulting in a significant reduction in cost and a reduction in weight of almost 20 percent.

It might make sense to eliminate pennies altogether. "If you were going somewhere, would you take the time to stop and pick up a penny on the ground?" asks Kohser.

The down side to taking pennies out of circulation is that most prices would tend to get rounded up slightly.

With the prices of metals on the rise in general, the U.S. Mint has been taking action. In 2006, it became a crime to melt pennies and nickels. "Both nickels and the older copper pennies have a [metal](#) value greater than the face value of the coins," Kohser says.

Last year, Concurrent Technologies Corp. was awarded a \$1.3 million contract to investigate more economical alternatives to the entire range of circulating coins.

But Kohser says solutions are evasive. For instance, weight and materials are problematic when it comes to things like vending machines. And those are the kinds of problems that metallurgists will have to solve, while making sure the coins are also acceptable to the public.

Provided by Missouri University of Science and Technology

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