

## Turning Copper coins 'silver' and 'gold'



### ***What is happening?***

When the zinc powder is added to the hot sodium hydroxide solution, it forms sodium zincate. When the copper coin is added (1 cent coins were 97% copper), some of the zincate ions gets transferred onto the surface of the copper coin as a layer of zinc, which gives it a shiny silver colour.

When you heat this 'silver' coin, after a few seconds brass is formed, which has a gold colour.

### ***Why does it work?***

It will not take place unless the copper and the zinc are in contact. Zinc is more reactive than copper, and so zinc metal dissolves during the reaction. At the same time, the zincate forms a zinc metal coating on the copper coin.

On heating the coin in the Bunsen flame, the zinc and copper atoms at the surface start to mix. Zinc and copper mixed together under heat forms brass, which has a gold colour. Brass is an alloy of copper and zinc.

### ***Did you know?***

*Zinc* is used to protect other materials from corrosion (rust).

Galvanised iron is used extensively in Australia for roofing, water tanks and many other purposes. Globally, over 80% of all zinc is used to coat steel structures, to protect them from corrosion.

Despite its relative abundance in the Earth's crust, due to its heavy usage in many industries, it is considered one of our most endangered elements, and we could run out in 20-30 years.