

Rock-it Science Observations For Winter Lessons 2010

Copper Plating (Hidden Metals)

The students had a beaker with copper sulfate dissolved in dilute sulfuric acid (3.8 N). They then put a shiny steel nail in the solution, some shiny copper, and a shiny quarter dollar coin. Then they attached clip leads to the metals and also to a nine-volt battery.

They may have noticed:

- Copper sulfate in solution is blue.
- A steel nail by itself in the solution makes tiny bubbles and becomes reddish brown.
- The reddish-brown stuff comes off fairly easily with a scrub pad.
- Copper placed in the solution by itself looks a little cleaner.
- The quarter placed in the solution by itself gains a very faint copper coloring.
- When the battery is attached to the copper and the nail, the nail changes color rapidly.
- If the nail was negative, it becomes copper colored, and the copper slowly becomes black.
- If the nail was positive, it gets black, and the copper gets shiny.
- When the quarter is put in with the copper... negative = copper colored.
- When the quarter is put in with the copper... positive = black.
- When the battery is used, the coloring is hard to remove.
- The batteries become hot with usage.