One of the most interesting characteristics of matter, and one that drives the study and exploration of chemistry, is the fact that matter changes. By examining a chemical reaction, such as the reaction of the element copper (Cu) and the compound silver nitrate ($AgNO_3$) in a water solution, you can readily observe chemical change. Drawing on a separation technique learned in class, you can separate the products from each other. You will then use a flame test to confirm the identity one of the products.

Problem

What evidence is there of a chemical reaction between copper and silver nitrate? What are the names of the two products?

Objectives

- Observe the reactants as they change into products
- Separate a mixture by filtration
- Predict the names of the products

Materials

Copper wire
$AgNO_3$
10-mL graduated cylinder
Beaker
Funnel
Filter paper
Nichrome wire
Tirrell burner
Striker

Procedure

1. Obtain approximately 20cm of Cu wire. Coil it and make a hook on one end. Stretch it to a length that will reach the bottom of your graduated cylinder.
2. Measure approximately 10 mL $AgNO_3$ solution into your graduated cylinder. *Do not allow the $AgNO_3$ to contact your skin or clothing.*
3. Record observations of the physical properties of the Cu wire and the $AgNO_3$ solution.
4. Place the Cu coil in the $AgNO_3$ solution and hook the Cu coil on the edge of the graduated cylinder.
5. Record observations of the wire and solution every 5 minutes for 20 minutes.
6. Remove the Cu coil from the $AgNO_3$ solution and dispose of it in a trash can.
7. Fold filter paper and place in funnel. Place the funnel in the beaker.
8. Slowly decant the mixture from the graduated cylinder into the filter paper. The liquid that collects beneath the filter paper is called the filtrate. Keep the filtrate and dispose of the filter paper and its contents in a trash can. Record observations.
9. Light a burner and obtain a blue inner cone. Dip the nichrome wire into the filtrate and then into the flame. Record observations.
10. Dispose of filtrate in the sink. Clean all glassware, funnel, and nichrome wire with tap water and dry. Return all items to their original locations.

*Adapted from Chemistry: Matter and Change

Group Members (1)

Title (1)

You should use the following checklist to make sure that you have all that is required in your lab report:

- ☐ Objectives (3)
- ☐ Experimental Design (10)
- ☐ Results: *Discuss all of your observations* (8)
- ☐ Conclusion: (*Did you meet all three objectives, **including** stating the names of the two products?)* (4)