

1.2 Definitions of matter (Copper and copper sulfate)

Subjects: Introduction to chemistry, definitions of matter

Description: This demo illustrates two concepts: the difference between an element and a chemical compound as well as the difference between heterogeneous and homogeneous mixtures (solutions).

Materials:

Cu metal

Copper Sulfate - CuSO_4

400 ml beaker

Water

Stir plate*

Stir bar

Spatula

*Shared item. Located in the top drawer opposite the chemical storage cabinets, or on the shelf above the center bench.

Procedure:

1. Prior to the demo, use the copper metal and CuSO_4 to illustrate the concept of an element versus a chemical compound, both of which are pure substances.
2. Place a beaker filled with water on a stir plate with a stir bar.
3. Use a spatula to scoop in chunks of CuSO_4 .
4. The copper sulfate will dissolve to produce a blue homogeneous solution.

Discussion:

This demo illustrates the following concepts:

- An element is a substance composed of one type of atom.
- A chemical compound is a pure substance composed of two or more different elements held together by chemical bonds.
- Homogeneous means a mixture that consists of two or more substances in the same phase (ex: solution).
- Heterogeneous means a mixture in which the uneven texture of a material can be detected.

Disposal: Dispose of copper sulfate solution in appropriate aqueous waste container.

References:

1. J. Kotz, P. Treichel, J. Townsend; *Chemistry and Chemical Reactivity*, 7th Ed;

Thomson Brooks/Cole; 2009