

ST
Lab Test Review

Meals, Metalloids, Non-Metals Lab

1. You are given an unknown substance and you record the following observations:
 - (1) The substance is a grey powder. The lab instructor points out that it also appears in other forms in which the appearance is different.
 - (2) When added to the acid, the substance does not seem to react initially. But eventually little bubbles form on its surface and gradually rise out of the liquid. If a stronger acid is used, bubbles form faster.
 - (3) The powder heats up very quickly.

Questions:

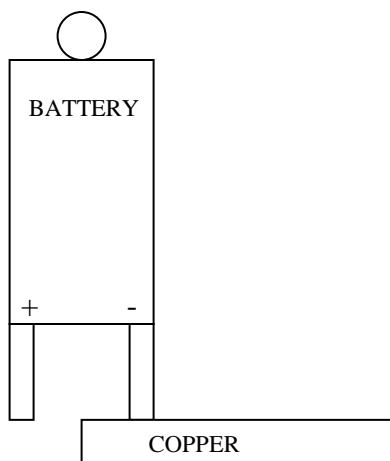
- a) The unknown is one of the following: P, Ge, Zn, Rn. Choose the one that is consistent with the observations.

Zn

- b) Explain why?

From the observations, the unknown does eventually react with an acid, so it cannot be a metalloid (can't be Ge). It is also a good conductor of heat (so it can't be a metalloid or non metal(P is a non metal) Rn is a noble gas and therefore a gas at room temperature.

2. A student touched a piece of copper with a conductivity apparatus. Even though the bulb and the battery were new, the light did not go on. Why?



3. A silvery cylinder is lustrous and does *not* react with acid. List three other properties that you expect this substance to have.

Both the (+) and (-) have to touch the sample.

Decomposition of CuO Lab

4. Two black powders were mixed in the CuO lab. One was CuO; the other, C. Eventually they went on to react to release a gas and to produce a copper-colored substance.

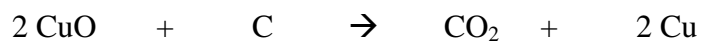
- a) Why was it important to mix the powders?

The atoms have to be in contact with each other to react. Without mixing it would react too slowly.

- b) Why were they heated?

Heating speeds up the reaction—just like in cooking.

- c) In one experiment a student weighed the limewater before and after the reaction. The difference in weight was a gain of 0.10 g.



The student had mixed 3.0 g of CuO with 2.0 g of C. After the experiment was over, the student also weighed the mixture of remaining black powders and coppery solid and found the mass to be 4.9 g.

Was the experiment a success? Explain.

Yes mass was conserved. $3.0 + 2.0 = 4.9 + 0.1$ g. CO₂ was detected and copper was made.

- d) What observation from the experiment supported the idea that carbon dioxide was released?

Limewater turned cloudy.

Lab Question Related to Alkaline Earth Metals

5. What **two** simple experiments can help you distinguish between grayish nuggets of calcium(Ca) and grayish nuggets of iron(Fe)?

(Describe one experiment that involves a physical property and one involving chemical properties.)

Physical property: they will have different densities. Also only Fe is magnetic.

Chemical property: calcium will quickly react with water to produce hydrogen gas. Fe will eventually rust but not produce hydrogen gas.