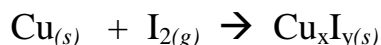


## DETERMINATION OF THE EMPIRICAL FORMULA OF COPPER IODIDE

### PURPOSE:

Determine the empirical formula of the copper iodide compound produced by direct synthesis from the elements, for the reaction:



### PROCEDURE:

Clean a strip of copper in 6M HCl. Rinse it in tap water, then rinse in distilled water, and finally dry with a hand towel. Dip in acetone and shake dry. Weigh the Cu strip to the nearest 0.0001 g.

Place approximately one spatula fill of iodine crystals in a 500mL Erlenmeyer flask. Bend the copper strip in half at a 90 degree angle and hang it over the edge of the flask, supported by the top of the flask clamp.

Heat the flask with a small hot flame, below a wire gauze screen, ring clamp, flask clamp, on a ring stand, using a Fisher or Bunsen burner. This needs to be set up inside the fume hood.

Heat the flask with iodine crystals until yellowish-white copper iodide crystals form on the copper strip. This requires about 1 to 2 minutes to produce a light coating of copper iodide, when the flask is hot. DO NOT allow the purple iodide vapor to pour out of the flask. Pull the burner flame from under the flask after each reaction. If purple iodine solid sublimates and condenses on the copper strip, hold the strip just above the flame, in the hot air, until it vaporizes. **DANGER: I<sub>2</sub> is very toxic – use the fume hood!**

Let the copper strip with the yellowish-white C<sub>x</sub>I<sub>y</sub> crystals cool, and then weigh (±0.001g).

Now dip the copper strip in a test tube or graduated cylinder containing a saturated solution of sodium thiosulfate Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>. Shake to remove the copper iodide crystals. Rinse the strip in tap and distilled water, and then dry. Dip the strip in acetone, shake it dry and weigh again (±0.001g).

Repeat the experiment a second time, as well as a third if time permits.

### CALCULATIONS:

Make all the necessary calculations to determine the empirical formula of this copper iodide, Cu<sub>x</sub>I<sub>y</sub>. Show all the setups, units and labels required. Watch your significant figures in these calculations. Report the empirical formula to the lowest mole ratio. Report any known and possible sources for error and discuss how you could remedy these errors in the future.