Name: _____ Class: _____ Date: _____

FINGERPRINTING
WITH CRYSTAL IODINE

Goal:

You will use a chemical reaction between potassium iodide (KI), hydrogen peroxide (H_2O_2), and hydrochloric acid (HCl) to create iodine crystals (I_2). Then, because iodine reacts with oils in human skin, you will use the iodine crystals to develop invisible fingerprints.

Materials:

- Hydrochloric acid
- Hydrogen peroxide
- Potassium iodide (white crystals)
- a funnel
- filter paper
- a Petri dish (with lid)
- two flasks
- a pipette
- blue scoop
- a beaker of water
- mystery fingerprints

Procedure:

1. Measure out 1 ml of potassium iodide (a little less than ¼ of a blue scoop) and add it to your Erlenmeyer flask (cone-shaped).
2. Add 3 ml of water to the flask. Swirl until the crystals dissolve.
3. Add 80 drops (4 ml) of hydrochloric acid to the flask.
4. Add 6 ml of hydrogen peroxide (H_2O_2) to the flask. Solution should turn brown.
5. Swirl the flask again to fully mix the compounds.
6. Take your clean flask and insert your funnel. Then put the filter-paper inside the funnel and fold it into a cone so that it fits snugly. Tape it closed, if needed.
7. Pour the brown liquid into the funnel and let it drain slowly. Use your pipette to rinse the brown iodine crystals with fresh water (about 5-6 squirts) Then let the fresh water drain.
8. Remove filter paper from funnel. Scoop up the gray crystals and put them into the bottom half of your Petri dish. Spread the crystals across the bottom of the dish and let them dry for 2-3 minutes.
9. Then find the lid of your Petri dish. Take a classmate's fingerprint and tape it upside-down to the underside of the lid (you want the fingerprint to be exposed to the evaporating iodine crystals, without touching them).
10. Put the lid on your Petri dish and let the fingerprint develop for 3-4 minutes.
11. Repeat steps 9 and 10 with your second classmate's fingerprint.
12. Compare your mystery fingerprints to the suspect's fingerprints (on the board).

Post-Lab Conclusions:

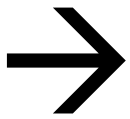
1. The equation for the chemical reaction is below.

$$2KI + 2HCl + H_2O_2 \longrightarrow I_2 + 2KCl + 2H_2O$$

2. Name the products and reactants (use common names).

3. Which of the products is the most valuable?

4. Draw a picture of the reaction below.



5. Draw a picture of a single KI molecule bonded together. What type of bond is it?

Draw a picture of a single I_2 molecule bonded together. What type of bond is it?

6. What unique features did your mystery-fingerprints have? What else would you need to figure out who the fingerprints belong to?