

# Chemistry in a Bag Lab

Name \_\_\_\_\_

## Materials per table group:

- 4 sandwich size zip top bags
- 3 film canisters (small plastic containers)
- 1 dropper
- 1 plastic spoon
- calcium chloride ( $\text{CaCl}_2$ )
- baking soda ( $\text{NaHCO}_3$ )
- Potassium Iodide Solution (KI)
- Lead Nitrate Solution  $\text{Pb}(\text{NO}_3)_2$
- Water ( $\text{H}_2\text{O}$ ) (Obtain from sink)
- Phenol Red
- goggles

**SAFETY:** Phenol Red is a body tissue irritant. Avoid contact with your skin. As the bags expand, care should be used to prevent excessive pressure build-up. The bags may burst. When calcium chloride is dissolved in water, heat is given off, so care must be used with these solutions.

**DISPOSAL:** Baggies may be placed in the trash can. Please DO NOT throw away the film canisters. Wash and return to the front. All solution may be poured down the drain, followed by water.

## Procedure Bag 1:

1. Place 1 level spoonful of **baking soda** into the bag.
  2. Add 5 mL of **Phenol Red** to the film canister.
  3. Add 25 mL of water to the film canister.
  4. **VERY CAREFULLY** - lower the film canister containing the 30 mL of liquid upright into the bag. Do **not** let any spill out.
  5. Have a student help you hold the film canister by squeezing the film canister gently from the outside of the bag while you squeeze the excess air out and seal the bag.
  6. Hold the film canister and bag up and slowly spill the liquid out of the film canister (while the bag is still sealed). Look, listen and feel. Record your observations: (color changes, gas being produced, heat being produced, precipitate, etc).
- 
- 
- 

## Procedure Bag 2:

1. Place 1/2 a spoonful of your **calcium chloride** into the bag.
  2. Add 5 mL of **Phenol Red** to the film canister.
  3. Add 25 mL of water to the film canister.
  4. **VERY CAREFULLY** - lower the film canister containing the 30 mL of liquid upright into the bag. Do **not** let any spill out.
  5. Have a student help you hold the film canister by squeezing the film canister gently from the outside of the bag while you squeeze the excess air out and seal the bag.
  6. Hold the film canister and bag up and slowly spill the liquid out of the film canister (while the bag is still sealed). Look, listen and feel. Record your observations: (color changes, gas being produced, heat being produced, precipitate, etc).
- 
- 
-

### Procedure Bag 3:

1. Place 1 spoonful of **baking soda** into the bag.
  2. Place  $\frac{1}{2}$  spoonful of **calcium chloride** into the bag.
  3. Mix the two powders together in the bag.
  4. Add 5 mL of **Phenol Red** to the film canister.
  5. Add 25 mL of water to the film canister.
  6. **VERY CAREFULLY** - lower the film canister containing the 30 mL of liquid upright into the bag. Do **not** let any spill out.
  7. Have a student help you hold the film canister by squeezing the film canister gently from the outside of the bag while you squeeze the excess air out and seal the bag.
  8. Hold the film canister and bag up and slowly spill the liquid out of the film canister (while the bag is still sealed). Look, listen and feel. Record your observations: (color changes, gas being produced, heat being produced, precipitate, etc).
- 
- 

### Procedure Bag 4:

1. Place 10 mL of Potassium Iodide solution into the bag.
2. Using a dropper, add 3 drops of Lead Nitrate solution to the liquid in the bag one drop at a time.
3. Look, listen and feel. Record your observations: (color changes, gas being produced, heat being produced, precipitate, etc).

## Chemistry in a Bag--Analysis and Results

- 1) Which bag(s) produced heat? How do you know this?
- 2) If phenol red is an acid base indicator which stays red in the presence of bases and turns yellow in the presence of acids, which bags were basic or acidic?
- 3) Without opening the bags, how can you tell if a gas was produced?
- 4) Which bag(s) produced a precipitate? How do you know this?
- 5) What evidence of chemical change did you observe?
- 6) What evidence of physical change did you observe?