Chemistry - Baggie Lab

**Purpose:**
*To make good observations.*
*To observe endothermic and exothermic changes.*
*To observe chemical and physical changes.*
*To observe change in indicators when pH changes.*

Note: observations are anything you see, hear, smell, touch, and taste - except we don’t taste in chemistry lab.

**Materials:**
- zip-loc baggie
- disposable cup
- plastic teaspoon
- sodium bicarbonate (NaHCO₃)
- calcium chloride (CaCl₂)
- acid/base indicator (shows acid or base, doesn’t react)

**Safety:** Wear goggles!!!
*If you remove your goggles, you will receive a zero for this lab.

**Procedure:**

**Part A**
1. Put ½ tsp. of sodium bicarbonate in one corner of your zip-loc bag. Record your observations of this chemical.
2. Put ½ tsp. of calcium chloride in the opposite corner of your zip-loc bag. Do not mix the chemicals. Record your observations of this chemical.
3. Pour about 1 mL (about ¼ of a pipet) the acid/base indicator AND 3 mL (about ¾ of a pipet) of distilled water in the disposable cup. Record your observations of this chemical.
4. Place the cup (upright-don’t spill the liquid) into the baggie. Close the bag, trying to remove all air.
5. Carefully pour the liquid into the corner with the sodium bicarbonate. Make your observations.
6. Once this reaction has completed, tip the zip-loc bag, so the liquid and sodium bicarbonate move to the calcium chloride corner. Again make your observations.

**Part B**
7. Put ½ tsp of calcium chloride in the corner of a different Ziploc bag.
8. Repeat steps #3 and #4 above.
9. Pour the liquid into the calcium chloride and record your observations.
10. Dispose of both bags and contents in the trash can. Wipe off your counter clean your spoon and put the spoon back in the front of the room.
11. Remove your goggles and place in the goggle cabinet correctly.
**Data Table**

<table>
<thead>
<tr>
<th>Chemicals</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium bicarbonate</td>
<td></td>
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<tr>
<td>calcium chloride</td>
<td></td>
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<tr>
<td>acid/base indicator</td>
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<td>sodium bicarbonate and indicator</td>
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<td>sodium bicarbonate, indicator,</td>
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<td>calcium chloride</td>
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<tr>
<td>Calcium chloride and indicator</td>
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</table>

**Discussion Questions:**

1. What is the definition of exothermic and endothermic?
2. Which reaction is endothermic? What proof do you have for that answer?
3. Which reaction is exothermic? What proof do you have for that answer?
4. Classify each of the reactants as solid, liquid, or gas.
   - Sodium bicarbonate – Water –
   - Calcium chloride – Indicator –
5. If the indicator chosen (universal) is green when it is neutral, blue when it is basic, and red when it is acidic, did you produce an acid or base during the 5th step with sodium bicarbonate?
6. Did you produce an acid or base during the 6th step when the sodium bicarbonate and indicator were added to the calcium chloride?
7. What is the evidence that indicates that changes in the compounds have occurred?
8. What changes were chemical?
9. What changes were physical?
10. Classify the products of the reactions as solid, liquid, or gas.
11. Which combination of the starting material produces the gas?
12. Which combination of the starting material produces the acid or base?
13. Using reference materials, propose possible chemical equations for the reactions in this lab.
   (Hint: Google – What do Calcium Chloride and Baking Soda make? See the ehow choice)
14. How would you test to see if these equations are correct? (consider the gas)
15. Discuss any sources of error. (more than one)

**Conclusion:** 1-2 sentences about what you learned in lab.
OBSERVING A CHEMICAL REACTION

http://teachers.net/lessons/posts/108.html

Purpose: Students will learn to make careful observations involving chemical reactions.

Materials Needed:

- Road salt (calcium chloride)
- Baking soda (sodium hydrogen carbonate)
- Indicator (phenol red or bromthymol blue work well)
- Baggies, sandwich size (regular and ziplock)
- Spatulas or plastic spoons
- 10 ml graduated cylinders

Procedure:

1. Put two scoops of road salt and one scoop of baking soda into a ziplock bag.

2. In another baggie (not ziplock) put 10 ml of indicator.

3. Place the baggie containing indicator inside the ziplock bag with salt and soda. Be sure the indicator baggie is completely stuffed into the ziplock bag.

4. Carefully squeeze all air out of the ziplock bag.

5. Zip the top of the ziplock bag.

6. Invert the bag so that all contents of both bags combine. Make observations.

Discussion:

Several evidences of a chemical reaction are very apparent (color change, gas produced, heat produced., etc.)

Make a list of all the observations you can gather. These include mass changes (if any), color changes, temperature of materials, sounds, and any other change you may note. Make this list on your own paper.
Introduces students to a chemical reaction involving a color change, the formation of a gas and heat changes from hot to cold. The students can actually hold this chemical reaction in their hands to see and feel the reaction take place. The acid-base indicator will change colors (from basic to acidic). For example: phenol red solution goes from red to orange to yellow. Universal indicator solution starts out green and changes to pink. Cabbage juice, changes from blue-green to purple to pink. The plastic bag will also inflate due to the formation of carbon dioxide gas.

You will need: calcium chloride, Sodium Bicarbonate (baking soda), Acid-Base indicator (any kind), Ziplock sandwich bags, spoons, graduated cylinder

1. Place one spoonful of calcium chloride into a plastic sealable bag.
2. Place one spoonful of sodium bicarbonate (BAKING SODA) into the bag. Seal the bag, shake it and see if a chemical reaction takes place.
3. Measure 10 ml (or 2 teaspoons) of indicator solution. Carefully add it to the bag. Flatten the bag to remove the air and seal it.
4. Tilt the bag back-and-forth to wet all of the solid. Squeezing the bag may also help in wetting the solid. Be careful not to squeeze the bag too hard as it might break or open up.
5. Observe the reaction. If the bag gets tight due to pressure, open the seal to release the pressure, then reseal it.
6. Answer the following:
   a.) How was this experiment different than the one before?
   b.) Did a noticeable reaction occur before the indicator solution was added?
   c.) What color change did the indicator go through?
   d.) Why does the bag inflate?
   e.) Does the reaction get hot or cold initially?
   f.) Does the reaction get hot or cold after 1 minute?
   g.) What observations did you make that tell you a chemical reaction is taking place?
   h.) Was this experiment a physical or chemical reaction?