

Title: Chemical Changes Lab

Purpose:

- to observe and record chemical changes involving chemicals found in common consumer products
- to demonstrate the use of names and formulas of common chemical compounds.

Materials

safety glasses	potassium iodide (KI)
small scale reaction surface	calcium chloride (CaCl ₂)
pipets	sodium carbonate (Na ₂ CO ₃)
sodium hydrogen carbonate (NaHCO ₃)	sodium hypochlorite (NaOCl)
sodium hydrogen sulfate (NaHSO ₄)	lead(II) nitrate (Pb(NO ₃) ₂)
phenolphthalein (phen)	silver nitrate (AgNO ₃)
starch	copper(II) sulfate (CuSO ₄)
ammonia (NH ₃)	hydrochloric acid (HCl)
bromothymol blue (blue dye)	sodium hydroxide (NaOH)

Procedure:

- Use small scale pipets to put 2 drops of each chemical on the X's in the indicated spaces below.
- For background contrast, view the drops on black and white backgrounds provided by the ?'s.
- Stir each mixture by blowing air through an empty pipet.
- Record in the Data Table
- Clean the small-scale reaction surface by absorbing the contents onto a paper towel, wipe with a damp paper towel, and dry. Dispose of the paper towels in the waste paper basket. WASH YOUR HANDS WITH SOAP AND WATER!

Results: Fill in the Data Table with observations

Discussion:

1. List the signs of chemical change.
2. Sodium hydrogen carbonate is baking soda (NaHCO₃). When HCl is added to NaHCO₃, carbon dioxide is formed. What is the chemical formula for carbon dioxide? In what consumer product is this gas commonly found?
3. Which of the other mixings forms bubbles?
4. What do you think the gas is that results from the mixings in Question 3?
5. The body uses hydrochloric acid (HCl) to help digest food. Where in the body is hydrochloric acid formed? What color does the bromothymol blue turn when HCl is added?
6. Sodium hypochlorite, NaOCl, is a common ingredient in household bleaches and cleansers. What happened to the color of bromothymol blue when both HCl and NaOCl are added?
7. Potassium iodide, KI, is the source of iodine in iodized salt. What color is the KI + NaOCl mixture? What color does starch change to in the presence of KI and NaOCl?
8. A precipitate is a solid that separates upon mixing solutions. Which reaction produced a bright yellow precipitate?
9. Which other mixings produced precipitates? Describe their colors and textures with words like milky, cloudy, grainy, etc.
10. Which solutions produced a distinctive *muddy brown* precipitate?

Conclusion: 1 sentence testable statement about the results. (Hint: focus on 1 of the reactions)

Reflection: Personal statement about the lab. Should be about 3-5 sentences!

EXPERIMENTAL PAGE:

Place **INSIDE** sheet protector for *Reaction Surface*. Use **2 drops** of solutions as indicated:

a.	?	NaHCO ₃ + HCl		h.	?	NaHSO ₄ + Na ₂ CO ₃
b.	?	HCl + Blue dye		i.	?	Na ₂ CO ₃ + phen
c.	?	Blue dye + NaOCl	Now add 1 drop HCl	j.	?	Phen + NaOH
d.	?	NaOCl + KI	Now add 1 drop starch	k.	?	NaOH + AgNO ₃
e.	?	KI + Pb(NO ₃) ₂		l.	?	AgNO ₃ + NH ₃
f.	?	Pb(NO ₃) ₂ + CaCl ₂		m.	?	NH ₃ + CuSO ₄
g.	?	CaCl ₂ + NaHSO ₄		n.	?	CuSO ₄ + NaHCO ₃

EXPERIMENTAL Data

Record your results in the spaces provided!

a.	<input type="text"/>	NaHCO ₃ + HCl		h.	<input type="text"/>	NaHSO ₄ + Na ₂ CO ₃
b.	<input type="text"/>	HCl + Blue dye		i.	<input type="text"/>	Na ₂ CO ₃ + phen
c.	<input type="text"/>	Blue dye + NaOCl	Now add 1 drop HCl	j.	<input type="text"/>	Phen + NaOH
d.	<input type="text"/>	NaOCl + KI	Now add 1 drop starch	k.	<input type="text"/>	NaOH + AgNO ₃
e.	<input type="text"/>	KI + Pb(NO ₃) ₂		l.	<input type="text"/>	AgNO ₃ + NH ₃
f.	<input type="text"/>	Pb(NO ₃) ₂ + CaCl ₂		m.	<input type="text"/>	NH ₃ + CuSO ₄
g.	<input type="text"/>	CaCl ₂ + NaHSO ₄		n.	<input type="text"/>	CuSO ₄ + NaHCO ₃