CHEM P106

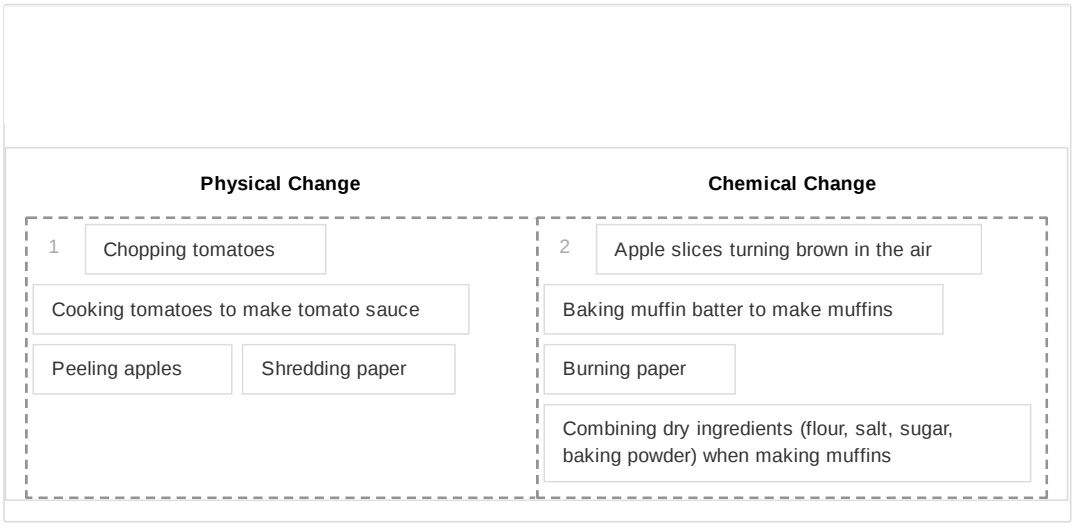
GOB-Observations of Chemical Changes

Final Report

Student Name	Irene Mendoza
Student ID	154855
Lesson	GOB-Observations of Chemical Changes
Institution	Porterville College
Session	Spring 2021
Course	CHEM P106
Instructor	Charles Grove

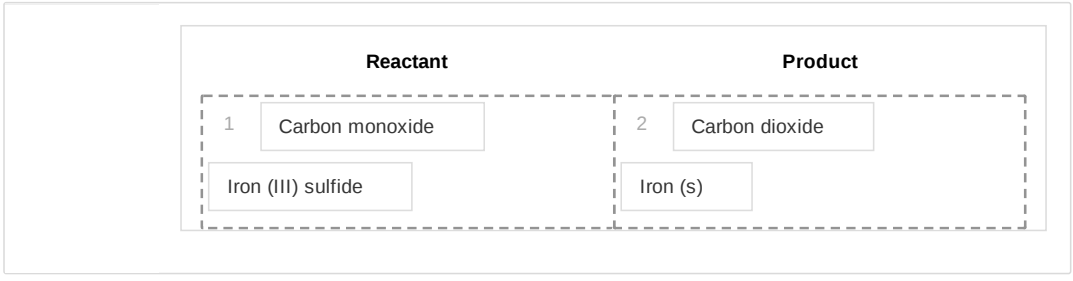
Test Your Knowledge

1. Categorize each change as physical or chemical.



2. Identify the products and the reactants in the reactions.

Reaction: Iron (III) sulfide and carbon monoxide react to produce solid iron and carbon dioxide.



Copyright 2021 - Science Interactive | https://scienceinteractive.com

3. Identify the products and the reactants in the reactions.

Reaction: Water and carbon dioxide are formed when ethane (C_2H_6) is burned in the presence of oxygen.

Reactant		Product	
1 Ethane	Oxygen	2 Carbon dioxide	Water

4. Identify whether each statement is an observation or a conclusion.

Observation	Conclusion
1 The solution is cloudy and there are small flakes.	2 No chemical reaction occurred.
The color changed from blue to green.	Combustion occurred.
The reactants and products are clear.	

Exploration

1. A chemical change may also be referred to as a _____.

- physical change
- chemical reaction
- chemical compound
- state of matter

SCIENCE INTERACTIVE eScience Labs & Hands-On Labs

Copyright 2021 - Science Interactive | https://scienceinteractive.com

2. Is silver tarnishing a chemical change or a physical change?

- (•) Chemical change
- ( ) Physical change

3. A chemical equation is the written representation of a chemical reaction, showing the relationship between the molecules of the reactants (the starting chemicals) and the products (the new chemicals produced through the reaction).

- (•) True
- ( ) False

4. An observation is _____.

- (•) a description of what happened
- ( ) an explanation of why something happened
- ( ) a conclusion

Exercise 1

1. Suppose a household product label says it contains sodium hydrogen carbonate (sodium bicarbonate). Using your results from Data Table 1 as a guide, how would you test this material for the presence of sodium bicarbonate?

i would add Hydrochloric acid to the samples and if there is an effervescence the product is likely to be sodium hydrogen carbonate.

2. Write the chemical equation for the reaction in well A6.

$AgNO_3$ (aq) + NaOH (aq) ------> AgOH(s) +NaNO3 (aq)

SCIENCE INTERACTIVE eScience Labs & Hands-On Labs

Copyright 2021 - Science Interactive | https://scienceinteractive.com

3. One of the reactions you observed resulted in the formation of a gas. What well did this reaction occur in? Describe how the observations for this reaction support your answer.

This reaction occurred in A1
This was the only reaction that caused any type of fizzing or gas, which would be the Carbon(iv)oxide

4. You found a sample of a solution that has a faint odor resembling vinegar (an acid). To verify that it is vinegar, you add a few drops of phenolphthalein. The sample turns pink. From this result, can you assume this sample is indeed vinegar or contains some vinegar? Explain your answer using your results from Data Table 1.

in an acid phenolphthalein does not turn pink.this only occurs in a basic.Hence this cannot be vinegar but sodium hydroxide which is basic.

5. While performing a starch test on several different cookie brands, four tests result in the typical black color of starch presence, but the fifth gives a yellow-brown color. How might you interpret this result?

My assumption would be the fifth cookie has a lower starch quantity as compared to the other cookies.The starch has not been removed completely but it's at a lower levels compared to the other cookies.

6. You have read that a new brand of hair tonic is supposed to contain lead (an ingredient in Grecian Formula®). Devise a simple test to confirm the presence or absence of lead in that hair tonic. Use your observations in Data Table 1 to describe a positive result for this test.

by dipping the hair tonic in lead(ii)iodide if the color turns yellow then the hair tonic contains lead

7. Is cutting a cake into 8 pieces a chemical or a physical change? Explain your answer.

This is a physical process since no new substance is formerd

Copyright 2021 - Science Interactive | https://scienceinteractive.com

8. When a soda is poured into a glass and the soda bubbles, is it the result of a chemical change? Explain your answer.

This is a chemical process since when the soda is being poured into the glass the carbon(iv)oxide escapes to the surrounding and this results to formation of bubbles. which results to change in mass of the soda

9. During the second step in well B1 what role does light provide? Did this reactant cause a chemical change? Use your observations to support your answer.

In the second step, the catalyst was direct sunlight.This is a chemical reaction because it turned the color of dark brown similar to rust on the paper towel

10. Based on your observation is well A4 and A5, did hydrochloric acid or sodium hydroxide cause a chemical change with phenolphthalein? Explain using any observations you collected in the experiment.

The reaction caused a physical process since no new substance is formerd in both cases

Data Table 1: Chemical Change Observations

SCIENCE INTERACTIVE
eScience Labs & Hands-On Labs
Copyright 2021 - Science Interactive | https://scienceinteractive.com

Well	Chemical #1 (4 drops)	Chemical #1 Appearance	Chemical #2 (4 drops)	Chemical #2 Appearance	Observations	Chemical Change (Y/N)
A1	$NaHCO_3$ Sodium Bicarbonate	colourless	HCl Hydrochloric Acid	colourless	bubbles	Y
A2	IKI indicator	colourless	Starch	white	Blue color	Y
A3	KI Potassium Iodide	colourless	$Pb(NO_3)_2$ Lead(II) Nitrate	colourless	Yellow color	Y
A4	NaOH Sodium Hydroxide	colourless	$C_{20}H_{14}O_4$ Phenolphthalein	colourless	Pinkcolour	Y
A5	HCl Hydrochloric Acid	colourless	$C_{20}H_{14}O_4$ Phenolphthalein	colourless	colourless	N
A6	NaOH Sodium Hydroxide	colourless	$AgNO_3$ Silver(II) Nitrate	colourless	BROWN	Y
B1	$AgNO_3$ Silver Nitrate	colourless	NH_4 Aqueous Ammonia	colourless	Observation 1: white + Absorb in paper towel and expose to sunlight Observation 2: brown	Y
B2	NH_4OH Aqueous Ammonia	colourless	$CuSO_4$ Copper(II) Sulfate	blue	deep blue	Y

Exercise 2

1. Describe the similarities and/or differences between heating and burning the magnesium metal. Did either heating or burning produce a chemical change? Explain your answer using the observations collected in Data Table 2.

For the magnesium, both reactions produced chemical change, resulting in the metal burning and turning to ash. The main difference in the two reactions came down to burning it.When directly over a flame, the magnesium bursts intoa bright white light, whereas in the test tube it just glowed white and turned into whiteashes.

SCIENCE INTERACTIVE eScience Labs & Hands-On Labs
Copyright 2021 - Science Interactive | https://scienceinteractive.com

2. Describe the similarities and/or differences between heating and burning the mossy zinc metal. Did either heating or burning produce a chemical change? Explain your answer using the observations collected in Data Table 2.

In heating only kinetic energy of the particles is increased and this process is reversible.Burning of mossy zinc only resulted to increase in temperature of the product and did not undergo a chemical change

3. Describe the similarities and/or differences between heating and burning the $Cu(NO_3)_2$. Did either heating or burning produce a chemical change? Explain your answer using the observations collected in Data Table 2.

on heating only thermal increase is obtained on copper(ii)nitrate and this can be reversed on cooling hence the process is physical.Heating of copper(ii)nitrate results to the thermal decomposition forming a brown copper(ii)oxide a brown gas nitrogen(iv)oxide and a colorless gas Oxygen.heating result to a chemical change

4. Describe the similarities and/or differences between heating and burning the $CuCO_3$. Did either heating or burning produce a chemical change? Explain your answer using the observations collected in Data Table 2.

on heating only thermal increase is obtained on copper (ii)carbonate and this can be reversed on cooling hence the process is physical.Heating of
copper (ii)carbonate results to the thermal decomposition forming a brown copper(ii)oxide and a colorless gas Caborn(iv) oxide.heating result to a chemical change

5. How would you describe the differences between heating and burning? Use your experiences in the experiment to describe these differences.

Heating results to increase in temperature only without formation of any new product.Burning results to a chemical change where a new product is formed.
in heating there is no change in mass but burning results to a change in mass since a new product is always formed

6. Which of the four chemicals that was heated produced a physical change? Support your answer with observations made and recorded in Data Table 2.

Mossy zinc.SINCE in both cases no new product was formerd but only resulted to an increase in temoerature

Data Table 2: Heating and Combustion

SCIENCE INTERACTIVE eScience Labs & Hands-On Labs
Copyright 2021 - Science Interactive | https://scienceinteractive.com

Chemical	Initial Observations	Heating Observations	Burning Observations
Mg	small shiny metal	formerd aWhite flame	white solid formerd
Zn	large silver color	melted into liquid	yellow solid formerd
$CuCO_3$	Green powder	green flame	black solid formerd
$Cu(NO_3)_2$	Blue crystals	green flame	brown gas formerd cracking sound black metal oxide

Competency Review

1. A _____ is a change in the form of a substance.

- (•) chemical change
- ( ) physical change

2. Identify an example of a chemical change.

- ( ) Boiling water
- (•) Cooking an egg
- ( ) Condensing vapor
- ( ) Cutting a steak

3. A chemical reaction is a process where the atoms of substances interact with one another to form new substances.

- (•) True
- ( ) False

4. In a chemical reaction the reactants are on the _____ of the written chemical equation.

- ( ) same side as the products
- ( ) right side
- (•) left side

SCIENCE INTERACTIVE
eScience Labs & Hands-On Labs
Copyright 2021 - Science Interactive | https://scienceinteractive.com

5. Physical observations can be used to determine if a chemical change has occurred.

- (•) True
- ( ) False

6. A(n) _____ is the explanation of why something happened and a(n) _____ is a description of what happened.

- ( ) observation; conclusion
- (•) conclusion; observation

7. A white precipitate formed from the mixing of two liquids is an indication of a chemical change.

- (•) True
- ( ) False

8. A metal is added to a liquid and bubbles form. What might be concluded?

- (•) A chemical reaction occurred.
- ( ) A physical change occurred.
- ( ) Both a chemical and physical change occurred.

9. Heating chemicals is defined by the process of combustion.

- ( ) True
- (•) False

10. _____ magnesium generates a very bright light.

- (•) Burning
- ( ) Heating
- ( ) Both burning and heating

SCIENCE INTERACTIVE
eScience Labs & Hands-On Labs
Copyright 2021 - Science Interactive | https://scienceinteractive.com

Extension Questions

Mark decided to investigate some household materials using the phenolphthalein solution. He placed 10 drops of each liquid or a small amount of solid (just enough to cover the tip of the spatula) in 2 mL of distilled water. Then he added 2 drops of the phenolphthalein solution and identified each substance as either an acid or a base, as shown in the table:

Tube #	Substance	Color before Phenolphthalein	Color after Phenolphthalein	Conclusion
1	Baking soda	Colorless	Pink	Base
2	White vinegar	Colorless	Colorless	Acid
3	Salt	Colorless	Colorless	Acid
4	Apple juice	Pale yellow	Pale yellow	Acid
5	Shampoo	Pale yellow	Pale yellow	Base
6	Window cleaner	Pale blue	Pale purple	Base
7	Milk	Slightly cloudy white	Slightly cloudy white	Acid

1. Can you draw any general conclusions about household materials based on his results?

Can you find any problems with Mark's logic?

one cannot be able to make a general conclusion since some of the solution were initially colored which affected the final color of the indicator.
Marks logic is wrong since he asummed that a substance is either acidic or basic.But a material can be neutral

SCIENCE INTERACTIVE
eScience Labs & Hands-On Labs
Copyright 2021 - Science Interactive | https://scienceinteractive.com