

Review Lab #2 name

20 LAB MINUTES

1. Thermochem, Conservation of Matter, Balancing, Mole Math & Entropy

Observe a candle, record its mass before lighting on fire, and let it burn for 10-12 minutes, and then blow it out. Record data in table, show math on white paper. The candle is made of paraffin wax that has a formula of $C_{24}H_{50}$.

1. What is the empirical formula for this wax?
2. What is the molar mass of the wax?
3. How many moles of wax were combusted?
4. Write the balanced chemical equation for this combustion reaction.
5. How many moles of oxygen reacted here?
6. How many moles of carbon dioxide formed?
7. Write the Law of Conservation of Matter.
8. Do the reactants or the products have more entropy? What is the reason for this?

<u>Data Table Part 1</u>	
<u>Candle mass initial</u>	g
<u>Candle mass final</u>	g
<u>mass of wax that combusted</u>	g

9. How much sodium chloride will react with 34.0 g of silver nitrate to produce 17.0 g of sodium nitrate and 28.7 g of silver chloride?

2. Gas Chemistry, combined gas law math.

Mass an empty balloon, then blow it up with your mouth. Tie it off, mass it full. We will assume the balloon contains ONLY carbon dioxide and it is at STP.

10. Write the names and formulas of any three other gases that are probably in the balloon with your CO_2
11. How many moles of CO_2 are in the balloon?
12. What is the volume of your balloon in liters?
13. Skip this one.

Balloon Data Table - Gas Chemistry	
Mass empty balloon	g
Mass full balloon	g
Mass of $CO_{2(G)}$	g

Observe your balloon in the bell jar as pressure drops normal to about 10 kPa.

14. What happens to the volume of the balloon as the pressure decreases?
15. State the relationship between pressure + volume of a gas.
16. Draw a graph with this title: volume as a function of gas pressure.
Label the axes and draw a proper line or curve for this relationship. Make it 4"x4" in size.
17. Does the balloon under low pressure have more CO₂ molecules than the balloon at normal pressure? If yes, where did these CO₂ molecules come from? If not, how did the balloon grow without adding more CO₂ molecules inside the balloon?
18. If your balloon started at 1.25 atm + 0.655 liters, what is the gas constant of this CO₂?
19. If a helium balloon of 36.0 liters at STP is released. It rises up, and temperature drops to a chilly -14°C while volume increases to 43.0 liters. What is the new pressure of the gas?
20. What conditions of pressure and temperature make any gas act more ideally?

Write the names of these compounds, or their proper formulas.		
21	(NH ₄) ₂ SO ₃	
22	Mercury (II) chromate	
23	Mg(MnO ₄) ₂	
24	Zinc nitride	
25	Li ₂ Cr ₂ O ₇	
26	Scandium bromide	
27	Al(NO ₃) ₃	

28	Lead (IV) oxide	
29	$\text{Sr}(\text{HCO}_3)_2$	
30	Lead (II) oxide	
31	NaClO_3	
32	Cobalt (II) phosphide	
33	$\text{Al}(\text{SCN})_3$	
34	Cobalt (II) phosphate	
35	$\text{Be}_3(\text{PO}_4)_2$	
36	Cobalt (III) phosphate	
37	NiPO_4	
38	Silver iodide	
39	$\text{Ni}_3(\text{PO}_4)_2$	
40	Copper (II) hydrogen carbonate	

41. What has been the most interesting thing you have learned all year in chemistry?