

# Review Lab #3

Name: \_\_\_\_\_

(40 minutes)

Do each part, answer the questions on loose-leaf paper, use plenty of space and be neat. Show off how much you have learned this year.

Part 1—Candle burning (demo). I will mass a candle and burn it for about 15 minutes. We'll mass it again, and see how much mass is lost. Answer all of the questions below.

Part 2—Spectrographs. Put on refractive lens glasses and draw the spectrograph being emitted from the lamp.

Part 3—Lewis Dot Diagrams. Draw the 6 diagrams from the cards. Some are correct, some are drawn purposely incorrect. Fix the ones that are in need of fixin'.

Part 4—Zinc metal in hydrochloric acid (be careful). Catch the gas with a larger test tube. Observe and check for exo or endothermic by touch. Test that gas with a burning splint of wood. Put the foil into the acid in a large test tube. Have a beaker to hold this tube when done.

Part 5—Pump up the bottle with the air pump quickly as you can. Note the temperature of the bottle as you pump. Let the air out quickly by giving the bottle cap a quick twist. Note temperature!

## Questions

Wax has the chemical formula of  $C_{22}H_{44}$ . Start mass \_\_\_\_\_ end mass \_\_\_\_\_

1. What is the molar mass of wax? How many grams were burned?
2. Write the balanced chemical equation for this reaction.
3. Is this wax an alkane, an alkene, or an alkyne? Explain why you know using a formula.
4. How many total grams of products form?
5. How many molecules of wax were burned?
6. How many moles of water form?

Draw the spectrograph on your white paper.

Draw 2 boxes like this into your lab questions and fill in the spectra emission lines

7. The gas in the tube is neon. What is the ground state electron configuration of neon?
8. What is one possible excited state electron configuration for neon?
9. When is the spectra produced, is it when the atom gains energy and the electron jumps up to an excited orbital?, or when the electron jumps back to the ground state?
10. How could a scientist use the concept of spectra to help her determine what substances were collected from a crime scene?
11. How could a scientist use spectra to determine what the chemical make up of a far away planet is?

The mustachioed Professor Lewis was a chemist who wanted to make his students understand bonding easier for his students to understand, so he invented his dot diagrams. Some people call them Electron Dot Diagrams or just Lewis Diagrams.

12. What do the dots around the chemical symbol in a Lewis Dot diagram represent?
13. Skip this one
14. Draw a Lewis Dot diagram for MgO.
15. Draw a Lewis Diagram for water.
16. Name the bond between one H and the O atom in water.
17. Name the bonds that form between water molecules?
18. How do you know that the bond between hydrogen and oxygen is polar?
19. Which bond is more polar, between H and O in water, or between H and Cl in hydrogen monochloride? How do you measure the polarity differences?

Draw the six dot diagrams CORRECTLY in these boxes.

--	--	--	--	--	--

Draw six boxes like this into your lab questions and fill in the six corrected Lewis Diagrams

20. Write the balanced chemical equation with phases for zinc metal plus hydrochloric acid.
21. Name the type of reaction is this?
22. Rewrite the balanced reaction without phases, but with oxidation numbers.
23. Write the two half reactions.
24. Write the net ionic equation.
25. Is there a spectator ion in this reaction? If yes, what is it?
26. Is this reaction exothermic or endothermic? Would the  $\Delta H$  be positive or negative?
27. 12.5 g of Zn completely reacts with 13.82 g HCl, forming 25.9 g  $ZnCl_2$ , how many grams of  $H_2(g)$  form?
28. How many moles of that gas formed? (assume STP)

Pumping the bottle with air quickly makes it warmer. Opening the top a bit makes the gas rush out fast, also creating a lower pressure, so it feels colder.

28. Name the relationship between pressure + temperature for a gas. Draw a small graph showing this.
29. Name the relationship between pressure + volume for a gas. Draw a small graph showing this.
30. You fill up a balloon with helium. You put in 375 g of helium gas at STP. How many moles of  $He(g)$  is that?
31. Assuming STP, what is the volume of this helium balloon?
32. If the balloon rises up to 11,200 meters into the air, the temperature drops to  $-33.0^\circ C$  and the pressure drops to just 0.821 atm. What is the new volume of your balloon?
33. Who loves chemistry? Has it been a good year? Thanks for being here with me, I had a lot of fun too!

This lab report requires:

Cover Page = 8 points Include a paragraph about how you feel this year went for you (so far)  
and how you feel about the upcoming Regents Exam  
on White paper 32 questions = 32 points

40 points total