

Chapter 1

- 1) Which of the following below is quantitative

Red smoke

banana smell

7.4 grams

solid to liquid change

→ numerical data

- 2) Put the following numbers into scientific notation

890000

 8.9×10^5

.00325

 3.25×10^{-3}

22000

 2.2×10^4

- 3) How many significant figures are in: 0.0078
- 2
- 400
- 1
- 500.0
- 4
- 0.030
- 2

- 4) What is the percent error if you calculate the density of aluminum to be 2.94 g/mL and the theoretical density of aluminum is 2.70 g/mL?
- 8.89%

- 5) Is the data accurate, precise, or both?

Experimental data: 5.57, 5.56, 5.58

Theoretical value: 5.59

both precise + accurate

Chapter 2

- 6) What is the density of an object if it has a mass of 28 grams and moves the water level from 4.5 mL to 11.5 mL?

 $\frac{4g}{mL}$ **Chapter 3**

- 7) Briefly describe the main idea of each scientist listed below:

Thomson - Cathode ray tube exp.
discovered electron

Rutherford - gold-foil exp., discovered nucleus

Mendeleev - arranged periodic table
by atomic massBohr - planetary model of
the atom

- 8) How many protons, electrons and neutrons are in each of the following

 $^{27}_{13}\text{Al}^{+3}$

Carbon-13

 Fe^{+2} S^{-2}

p= 13

p= 6

p= 26

p= 16

n= 14

n= 7

n= 30

n= 16

e= 10

e= 6

e= 24

e= 18

- 9) What is the average atomic mass of element "X" if it is 74% X-45, 18% X-46 and 8% X-47?

45.34

Chapter 4

- 10) If carbon has a half-life of 5730 years, how much of a 800 grams sample will be left after 17190 years?

100g

- 11) What element has the electron configuration:
- $1s^2 2s^2 2p^5$

Fluorine

- 12) Which element has electron configuration
- $ns^2 np^3$

Li (N) Si F

Chapter 5

- 13) Which elements would have similar properties to Na?? Mg (K) Al (Li)
14) What family of elements has 8 valence electrons? noble gases

Chapter 7

15) Name the following:

SiO₂ silicon dioxide

Mg₃N₂ magnesium nitride

AlF₃ aluminum fluoride

Cu₂O copper (I) oxide

Cl₂O₇ dichlorine heptoxide

N₂O₄ dinitrogen tetroxide

16) Write the formula of the following:

Lithium nitride Li₃N

diphosphorus pentoxide P₂O₅

Iron (III) sulfide Fe₂S₃

nitrogen tetroxide NO₄

Magnesium hydroxide Mg(OH)₂

hydrochloric acid HCl

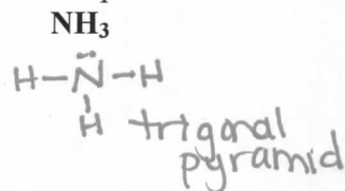
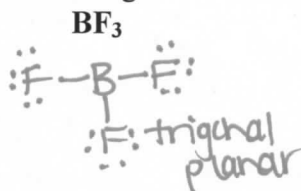
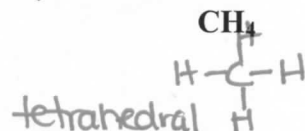
17) What happens to electrons in an ionic bond? transferred covalent bond? shared

Chapter 8

18) Draw the Lewis Dot structure of the following elements:



19) Draw the Lewis Dot structure of the following molecules and name the shape:



Chapter 9

20) What are the seven diatomic elements? Br I N Cl H O F

Complete the reaction, identify the type, & balance.

21) Type: SR Iron (III) bromide + Chlorine →



22) Type: DR Calcium nitride + Potassium sulfide →



23) Type: D Lithium phosphide →



24) Type: S Aluminum + Iodine →



Chapter 10

Find the percent composition of each element in the following compounds:

25) H_3PO_3 %H = 3.66 %P = 37.78 %O = 58.56

26) $\text{C}_6\text{H}_{12}\text{O}_6$ %C = 40.0 %H = 6.67 %O = 53.3

27) Convert 52 liters of oxygen (O_2) at STP to grams.

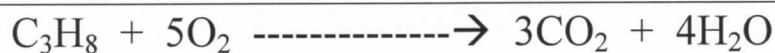
$$74.29\text{g}$$

28) How many molecules are equivalent to 4.5 mol of glucose ($\text{C}_6\text{H}_{12}\text{O}_6$)?

$$2.71 \times 10^{24} \text{ molecules}$$

Chapter 11

Use the reaction in the box below to answer questions #29-30



29) If 128g of ^(O_2) oxygen react with propane, how many grams of carbon dioxide will be produced?

$$105.6\text{g}$$

30) If 3 moles of water were produced, how many moles of C_3H_8 were consumed?

$$0.75\text{mol}$$

Chapter 12

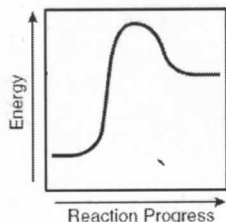
31) Convert: $22^\circ\text{C} =$ 295 Kelvin

32) What are the three characteristics of a catalyst?

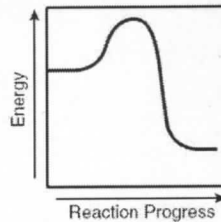
Speeds up a reaction, lowers activation energy,
is not used up

33) Define: "absolute zero" all molecular motion stops, 0 kelvin or -273°C

34) Identify the energy curves as endothermic or exothermic. Describe what happens to energy.



Type: endothermic
Energy: absorbed



exothermic
released

35) Define: sublimation = solid \rightarrow gas condensation = gas \rightarrow liquid

36) The specific heat of aluminum is $0.900 \frac{\text{J}}{\text{g}^{\circ}\text{C}}$. How much heat is required to raise the temperature of a 55.0 g block of aluminum from 35.0°C to 95.0°C ?

$$H = mc\Delta T$$

$$2970 \text{ J}$$

Chapter 13

37) A balloon has a volume of 8 liters with a pressure of 770 mmHg. If the pressure is decreased to 630 mmHg, what is the new volume of the balloon?

$$9.78 \text{ L}$$

38) In a closed system, 176 g of CO_2 is in a container with a volume of 4.5 L and a temperature of 35°C . What is the pressure of this system in kPa?

$$R = 8.31 \frac{\text{kPa} \cdot \text{dm}^3}{\text{moles} \cdot \text{K}}$$

$$2275.09 \text{ kPa}$$

39) A tire starts off with a volume of 3.5 L at a temperature of 35°C . What will be the new volume if the temperature of the tire increases to 65°C ?

$$3.84 \text{ L}$$

Chapter 15

40) How many grams of H_2SO_4 are required to make 3 liters of a 0.40 M solution of H_2SO_4 ?

$$117.68 \text{ g}$$

41) What is the final concentration if 300.0 mL of a 2.0 M HCl solution are diluted to 800.0 mL?

$$0.75 \text{ M}$$

42) Briefly explain why water and oil do not mix. "like dissolves like" - water is polar and oil is nonpolar

Chapter 18

43) Define pH: hydrogen ion (H^+) concentration