

Name _____ Period ____ Date _____

Chemistry Final _____/119 Total Points

Please write all of your answers in the space given on the left. Unless otherwise specified, all questions are worth one point.

How many significant figures in the following numbers?

_____ 3204

_____ 56.040

_____ 0.00000007

Carry out the following calculations and write your answers in the correct number of significant figures.

_____ $78.973 + 0.4$ _____ 9.0×36.12309

Convert the following numbers into scientific notation

_____ 3489000000000000

_____ 0.000000000000000650

Use dimensional analysis to solve the following. Write your final answer in the space on the left, but make sure to show your work on the right. 2 pts. each

_____ Convert 6700 grams to kilograms

_____ Convert .98 mL to L

_____ How many atoms are in 3 moles of Carbon?

_____ How many moles are in 1.8×10^{24} atoms of Carbon?

_____ How many moles are in 32 grams of Carbon?

_____ How many molecules are in 88 g of CO_2 ?

_____ EXTRA CREDIT: 1 mole of gas has a volume of 22.4 L. If I have 24 g of Carbon, how many liter of Carbon dioxide gas can I make?

Classify the following as an element, mixture or compound

_____ cookie dough

_____ sodium chloride

_____ gold

_____ aqueous solution of magnesium sulfate

What are the signs of a chemical change? (2 pts.)

Classify the following as a chemical change or a physical change

_____ bicycle rusting

_____ baking a cake

_____ fireworks exploding

_____ water evaporating

_____ What does the atomic emission spectra for an element correspond to?

- the number of energy levels of electrons
- the number of jumps between energy levels by electrons
- the number of photons emitted by protons
- the wavelengths of light given off by neutrons

Name one notable difference between the Bohr model and the Quantum mechanical model. 2 pts.

_____ Which sublevels are contained in principal energy level 3?

What is the electron configuration for Iron? 2 pts.

Draw the Lewis structures of the following:

_____ Phosphorus

_____ Magnesium

Write a symbol for an element that is an example of the following:

_____ metal

_____ nonmetal

_____ metalloid

_____ alkali metal

_____ alkaline earth metal

_____ halogen

_____ noble gas

_____ _____ What is the only stable group of elements?

_____ Do halogens lose or gain electrons?

_____ What type of ions do they form?

_____ Do alkaline metals lose or gain electrons?

_____ What type of ions do they form?

Name the following compounds (2 pts. each) :

_____ CaCl_2

_____ FeO

_____ $\text{Mg}(\text{NO}_2)_2$

_____ H_2SO_4

_____ N_2O_5

Write the formula for the following compounds (2 pts. each):

_____ Copper (II) chlorate

_____ Potassium sulfide

_____ Potassium sulfate

_____ Chlorous acid

_____ Hexaboron silicide

Draw the structural formula for Carbon dioxide (2 pts.)

_____ What is the 3-D shape of Carbon dioxide?

_____ Are carbon dioxide's bonds polar or nonpolar? How do you know (2pts.)?

_____ Is carbon dioxide a polar or nonpolar molecule? How do you know (2pts.)?

Based on your last answer, what properties (melting point, conductivity, etc.) does carbon dioxide display (2 pts.)?

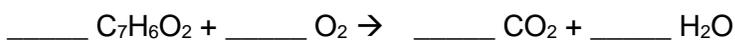
Balance the following equations. Identify the type of reaction.



_____ Type



_____ Type



_____ Type

Write a complete balanced equation for the following (1 point for each correct formula and 1 point for balancing):

Sodium oxide reacts with carbon dioxide to form sodium carbonate.

Potassium nitrate decomposes to form potassium nitrite and oxygen.

Determine whether the following single displacement reactions happen. If they do, write a complete balanced equation. If they don't, leave the space blank. (1 point for correctly stating if reaction occurs or not, 1 point for each correct formula and 1 point for balancing)

calcium + hydrochloric acid

silver nitrate + nickel

Determine whether the following double displacement reactions happen. If they do, write a complete balance equation and circle the precipitate. If the reaction doesn't happen, leave the space blank.

A solution of ammonium carbonate is mixed with a solution of calcium acetate.

A solution of sodium chromate is mixed with a solution of barium sulfate.