

Semester Exam Review

Name _____

REMEMBER YOUR UNITS!!

Sections 0 and 1A

1. Explain the location of 3 pieces of safety equipment in the room and explain a situation in which you would use each of them.
2. What is the formula for density?
3. What is the density of an object having a mass of 13.0 g and a volume of 48 cm³?
4. What is the volume of an object that has a mass of 20 grams and a density of 2 g/cm³?
5. How many millimeters is 34 meters?
6. How many centimeters is 2.3 kilometers?
7. How many kilograms are in 389 grams?
8. Explain the difference between a physical change and a chemical change.
9. Name three examples of physical changes and three examples of chemical changes.
10. In the compound MgCl₂, what is the ratio of magnesium atoms to chloride atoms?
11. In Ca(OH)₂, what kind of atoms are present and how many of each kind are there?
12. Draw a picture of an atom, an element, a molecule, and a compound. Label which is which.

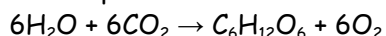
Section 1B

- Does the radius of atoms get smaller or larger as you move across the periodic table from left to right? Explain why.
- Do atoms get smaller or larger as you move down the periodic table? Explain why.
- As you go across the periodic table from left to right, does it get easier or harder to remove an electron? Explain why.
- As you go down the periodic table, does it get easier or harder to remove an electron? Explain why.
- Identify the number of protons, neutrons, and electrons for the following atom of Boron:
$${}_{15}^{31}\text{P} - 3$$
- Identify the number of protons, neutrons, and electrons for the following atom of Tin
$${}_{50}^{119}\text{Sn} + 2$$
- What is the correct symbol for an ion that has 20 protons, 20 neutrons, and 18 electrons?
- Draw atoms in 3 closed beakers. In beaker A, the atoms make up one piece of a solid. In beaker B, the atoms make up a liquid. In beaker C, the atoms make up a gas.
- What is a polyatomic ion? List 4 examples.
- What is the correct formula for a compound between aluminum (Al^{+3}) and carbonate (CO_3^{-2})?
- If an atom of Argon is neutral, how many protons, neutrons, and electrons does it have?
- Explain the difference between carbon-12 and carbon-14.
- What is the most important part of an atom, in terms of properties for that element and where it sits on the periodic table?

26. What name do we use to describe a row on the periodic table?
27. What names do we use to describe a column on the periodic table?
28. List the names of the first two groups and the last two groups of the periodic table. Explain which is which.

Section 1C

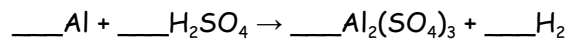
29. List the type of atoms and the number of each type of atoms on the reactant side of the following equation. Do the same for the product side of the following equation.



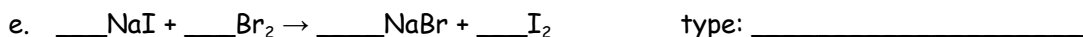
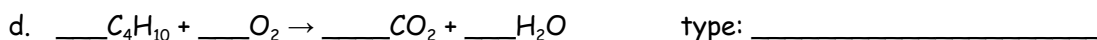
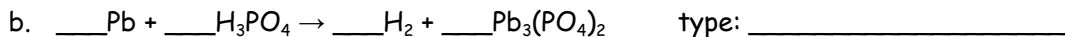
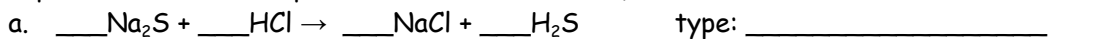
30. How many moles of Boron are present in 128.0 g?
31. What is the mass of 23.0 mol of Na_2S ?
32. What is the percent mass of oxygen in $\text{Ca}(\text{NO}_3)_2$?
33. What is the percent mass of potassium in potassium sulfate ?
34. How many molecules are in a mole?
35. How many molecules are in 4 moles of carbon dioxide?
36. What is the molar mass of aluminum oxide?
37. How many atoms of carbon are in a piece of coal that weighs 2.15 g?
38. Name the chemical compounds.
- | | |
|-----------------------------|-------------------------------|
| a. NaF | c. $\text{Fe}(\text{NO}_3)_2$ |
| b. $\text{Ca}(\text{OH})_2$ | d. NH_4Br |
39. Write the chemical formula for the chemical name.
- | | |
|----------------------|----------------------|
| a. Potassium sulfide | d. Aluminum sulfate |
| b. Magnesium oxide | e. iron (III) iodide |
| c. Lithium nitrate | |

Section 1D

40. Balance the equation:



41. Balance the following equations. What kind of equation are they (synthesis, decomposition, single replacement, double replacement, or combustion?)



42. Predict the products of the following reactions. Name the types of reactions they are.



Sections 2A and 2B

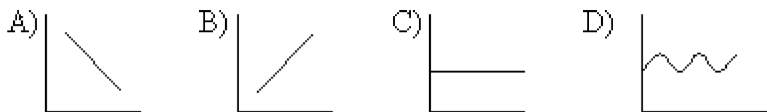
43. Explain the cause of pressure.

44. As pressure goes up, volume goes _____. As pressure goes down, volume goes _____

45. As pressure goes up, temperature goes _____. As pressure goes down, temperature goes _____.

46. As volume goes up, temperature goes _____. As volume goes down, temperature goes _____.

Use the following diagram to answer questions 47 and 48.



47. Which of the above lines best represents the relationship between pressure (y-axis) and volume (x-axis)?

48. Which of the above lines from the last question best represents the relationship between pressure (y-axis) and temperature (x-axis)?

49. Explain what will happen if you take an inflated balloon from a hot room into a cold room.

50. Explain what will happen if you take an inflated balloon from a cold room into a hot room.

51. Convert -52°C to Kelvin
52. Convert 124 kelvin to Celsius.
53. Convert 75°F to Kelvin.
54. What is temperature a measurement of?
55. Convert 15.8 psi into atm.
56. Convert 1.97 atm into mmHg.
57. Calculate the temperature of 45 g of Cl_2 in a 2 L flask at 35 atm.
58. A sample of CH_4 gas occupies 500 mL at a pressure of 1.25 atmospheres. If the gas is compressed to 245 mL (keeping temperature constant), what will be the final pressure?
59. How many grams of helium will the gas inside a balloon weigh if the balloon holds 185 L of helium gas at STP?
60. How many moles of hydrogen gas would be contained in a 4.75 L container at 120°C and 90 atm of pressure?
61. A gas at a temperature of -33°C occupies 0.8 liters. What will be the final volume of the gas if its temperature is raised to 40°C (pressure is held constant)?

Section 2C

62. List the four most abundant gases in the atmosphere, in order from most to least.
63. What is the greenhouse effect?

64. Explain the problem that would be caused by the presence of too many greenhouse gases in the atmosphere.
65. Name three gases that contribute to the greenhouse effect and circle the one with the greatest effect.
66. List the parts of the electromagnetic spectrum, in order from least energy to greatest energy.
67. What is wavelength? Explain the relationship between wavelength, frequency, and amount of energy.
68. As the following reaction takes place, will the volume increase, decrease, or stay the same?

$$3 \text{H}_2 + \text{N}_2 \rightarrow 2 \text{NH}_3$$
69. If you need to make 8 moles of NH_3 , how much hydrogen should you use?
70. If you mix 6 liters of sodium chloride with fluorine, how much sodium fluoride will you expect to make? How much chlorine will you expect to make?
71. Determine the freezing point and boiling point of the substance to the right based on its heating curve.

