

1. Calculate the following quantities.

a. 75.6°F in Kelvin.

b. 164.3 lb in milligrams (1 lb = 16 oz, 1 oz = 28.35 g)

c. The volume of a room that measures 10.5 ft by 21.2 ft by 9.1 ft in Liters. (1 in = 2.54 cm, 1 ft = 12 in)

d. A speed of 55 miles per hour in kilometers per second. (see conversions above and 1 mi = 5280 ft)

2. Complete the following table.

Name of Element	Complete Symbol	Number of protons	Number of Neutrons	Atomic Number	Mass Number
Tin			69		
		42			96
			53		95
	$^{235}_{92}\text{U}$				
		16	16		
			31	26	

3. An element has the following isotopic composition:

Isotopic mass (amu)	Percent abundance
83.913425	0.56
85.9092624	9.86
86.9088793	7.00
87.9056143	82.58

Calculate the *relative average atomic mass* of this element. What is the *name of the element*? What *group and period* is this element in?

4. Complete the following table:

CH ₂ S	Electron Pair Geometry	NI ₃	Electron Pair Geometry
	Molecular Geometry		Molecular Geometry
	Polar?		Polar?
CS ₂	Electron Pair Geometry	NO ₂ ⁻	Electron Pair Geometry
	Molecular Geometry		Molecular Geometry
	Polar?		Polar?

5. Complete the following table:

Name of Compound	Formula
Sodium Dichromate	
	N_2O_3
	Li_3PO_4
Ammonia	
Tetraphosphorus Decoxide	
	$\text{HCl}(aq)$
Carbon Tetrafluoride	
	H_2O
	$\text{Ca}(\text{ClO}_2)_2$
Iron(III) Perchlorate	
Ammonium Sulfide	
	AuCl

6. Ammonium Sulfide solution reacts with Iron(III) Nitrate solution in a double replacement reaction. Write the balanced chemical and net ionic equations. Calculate the **mass of the solid produced** if 25.66 mL of 0.1566 M Ammonium Sulfide solution reacts with excess Iron(III) Nitrate solution. (Solubility rules are on the back of your periodic table.)

7. A rigid 25.67 L container is filled with 25.76 g of Carbon Dioxide gas, 15.77 g of Helium gas and 32.54 g of Nitrogen gas. The temperature of the container is -15.67°C. Calculate the ***total pressure in the container in atm*** and the ***partial pressure of each of the gases in atm***.
8. 150.0 g of fructose ($C_5H_{10}O_5$) reacts with 100.0 L of Oxygen gas at 45.6°C and a pressure of 1.336 atm. The products are Carbon Dioxide gas and liquid water. Calculate the volume of liquid water that can be produced from this reaction. (density of water at 45°C is 0.9884 g mL^{-1}) If only 80.00 mL of water is produced what is the percent yield of the reaction?

9. A compound is found to have a density of 6.206 g/L at 756.3 mmHg and 24.1°C. When 43.78 mg of this compound is burned it produces 38.00 mg CO₂, 20.74 mg H₂O and 8.06 mg N₂. What is the *molecular formula* of this compound?