

BASIC CONCEPTS OF CHEMISTRY
Chapter 5 – Review Worksheet

- 1) Calculate the molar mass of the following compounds:
 - a) $(\text{NH}_4)_3\text{PO}_4$ (ammonium phosphate)
 - b) $\text{Ca}(\text{C}_6\text{H}_{12}\text{NSO}_3)_2$

- 2) Epsom salts is hydrated magnesium sulfate, $\text{MgSO}_4 \cdot 7 \text{H}_2\text{O}$. Hydrated compounds will lose their water of hydration when heated.
 - a) Using the above formula calculate the theoretical percentage of water in the compound.

 - b) When 2.000 g of the compound were heated a residue with a mass of 0.925 g was formed. What is the experimental percentage of water in the compound?

 - c) What is the percentage error in the experiment?

- 3) Given the old gasoline additive tetraethyl lead, $\text{Pb}(\text{C}_2\text{H}_5)_4$,
 - a) What is the percentage of lead in the compound?

 - b) How many grams of lead are present in 1.0 lb (454 g) of the additive?

- 4) How many grams are present in the following?
 - a) 0.40 moles of manganese, Mn
 - b) 448 mL of oxygen, O_2 , at STP
 - c) 2.5×10^{18} molecules of CO_2
 - d) 1 molecule of $\text{C}_6\text{H}_{12}\text{O}$

- 5) How many molecules are present in the following?
 - a) 2.5 moles of sucrose, $\text{C}_{12}\text{H}_{22}\text{O}_{11}$
 - b) 6.72 L of carbon dioxide, CO_2 , at STP
 - c) 2.8 g of propane, C_3H_8

- 6) How many moles are present in the following?
 - a) 5.86 g of silver, Ag
 - b) 135,500 L of helium, He, at STP
 - c) 6.32×10^{24} molecules of chloroform, CHCl_3
 - d) 3.25 kg of $(\text{NH}_4)_2\text{CO}_3$

- 7) What volume of gas at STP is present in each of the following?
 - a) 0.30 moles of carbon monoxide, CO
 - b) 9.2 g of nitrogen dioxide, NO_2
 - c) 1.20×10^{22} atoms of neon, Ne
 - d) 5.6 g of nitrogen, N_2

- 8) How many sodium ions are there in 28.4 g of sodium sulfate, Na_2SO_4 ?

- 9) What volume of glycerine, $\text{C}_3\text{H}_8\text{O}_3$, (density 1.26 g/mL) should be taken to obtain 2.5 moles?