***The Mole Review!***

*Complete the following to study for the Mole Concept… The answers are located after the questions.*

1)Find the molar mass of the following:

**a)** CaCO3

**b)** manganese(IV) oxide

**c)** calcium phosphate

**d)** zinc(II) chloride nonahydrate

2) How many moles are there in a 124 g sample of C8H18?

3) How many atoms are there in 12 molecules of cobalt(II) sulphate pentahydrate?

4) What is the mass of 5.99 mol of C6H2Cl4?

5) How many molecules are there in 3.2 mol of sodium chloride?

6) How many moles in 4.114 x 1087 molecules of nitrogen trifluoride?

7) How many moles in 1200 mL of oxygen gas at STP?

8) What is the percentage composition of iron in FeCl3?

9) What is the percentage composition of potassium in K3PO4?

10) What is the mass of 5 million atoms of copper?

11) What is the mass of 400.0 mL of fluorine gas at STP?

12) 50.0 mL of butane gas at STP contains how many molecules?

13) How many molecules in 3 kg of potassium iodide?

14) What is the volume of 4.92 g of hydrogen gas at STP?

15) What is the volume of 3.66 x 1032 molecules of fluorine gas at STP?

16) What is the percentage composition of calcium chloride?

17) What is the percentage composition of iron(III) nitride?

18) A gas has an empirical formula CH2. If 0.850 L of the gas at STP has a mass of 1.59 g, what is the molecular formula?

19) What is the concentration of aqueous sodium chloride, when 5.00 g of NaCl is dissolved in 500.0 mL of water?

20) What is the volume used to make 0.0250 M of NaF using 2.00 g of NaF?

21) What is the density of carbon tetrachloride at STP?

22) If 3.25 x 1021 molecules of a solid has a mass of 0.229 g, what is the molar mass of this solid?

23) What is the density of 4.00 x 1020 molecules of vanadium(V) iodide contained in a 2.0 L sample?

24) What is the percentage composition of tungsten(VI) nitride nonahydrate?

25) What is the density of propane (CH3CH2CH3) at STP?

26) What is the empirical formula of 101.0 g of carbon, 10.52 g of hydrogen and 88.4 g of nitrogen?

27) What is the empirical formula of 26.6 % K, 35.4 % Cr, and 38.0 % O?

28) What is the mass contained in 25.00 mL of 5.5 x 10-4M of strontium nitrate?

29) Are you having a good day?

30) A gas has a percentage composition: 30.4 % N and 69.6 % O. If the density of the gas is 4.11 g/L at STP, what is the molecular formula of the gas?

31) Give the correct procedure, including apparatus and numerical values, to make a 0.500 M solution of NaCl.

PLUS: Hebden

**1) a)** 100.09 g/mol **b)** MnO2 = 86.94 g/mol **c)** Ca3(PO4)2 = 310.18 g/mol **d)** 298.47 g/mol

**2)** 1.09 mol **3)** 252 atoms **4)** 1.29 x 103g **5)** 1.9 x 1024molecules

**6)** 6.83 x 1063moles **7)** 0.054 mol **8)** %Fe = 34.43% **9)** %K = 55.26%

**10)** 5 x 10-16g **11)** 0.679 g **12)** 1.34 x 1021molecules **13)** 1 x 1025 molecules

**14)** 55 L **15)** 1.36 x 1010 L **16)** Ca = 36.11%, Cl = 63.89% **17)** Fe = 79.95%, N = 20.05%

**18)** C3H6 **19)** 0.171 M **20)** 1.90 L **21)** 6.867 g/L

**22)** 42.4 g/mol **23)** 0.228 g/L **24)** W = 49.15%, N = 7.49%, H = 4.86%, O = 38.50%

**25)** 1.961 g/L **26)** C4H5N3 **27)** K2Cr2O7 **28)** 2.9 x 10-3g

**29)** I hope so! **30)** N2O4 **31)** as in notes