**Final Exam Twitter Review #3**

FE3-1: How many protons and electrons are in a Cu^2+ - 64 ion, respectively?

- Answer: 29 p+ ; 27 e-

FE3-2: What is the name of the compound with the chemical formula CrCl3?

* Answer: Chromium (III) Chloride

FE3-3: If two oxygen atoms combine to make a molecule, what type of bond will they form? Be very specific.

* Answer: (Double) Covalent Nonpolar Bond

FE3-4: Earnest Rutherford noticed alpha particles went straight through gold foil in his gold foil exp. What can be concluded about an atom?

* Answer: Most of an atom is empty space.

FE3-5: How does an N^3- ion differ from an electrically neutral nitrogen atom?

* Answer: # of electrons (N^3- has 3 more electrons)

FE3-6: A gas under a pressure of 74 mmHg and a temp of 75°C occupies a 500.0-L container. How many moles of gas are in the container?

* Answer: PV=nRT 🡪 n=1.7 moles

FE3-7:  
A) What is the density of a 100. g sample of metal that occupies 9.00 cm^3?  
B) What is the identity of this metal?

* Answer: A) 11.1 g/cm^3 B) Lead

FE3-8: How many total orbitals are contained in a “d” block element in the third energy level?

- Answer: 3d^10 🡪 5 Orbitals

FE3-9: What is the volume (L) of 2.00 moles of nitrogen gas (N2) at STP?

* Answer: 44.8 L N2(g)

FE3-10: What volume (L) of C2H2 is required to form 40.0 L of CO2 at STP? \_\_ C2H2(g) + \_\_ O2(g) 🡪 \_\_ H2O(g) + \_\_CO2(g)

* Answer: 2,5,2,4 🡪 20.0 L C2H2(g)

FE3-11: In an experiment, 2.62 g of iron react completely with 1.50 g of sulfur. What is the empirical formula for the compound produced?

* Answer: EF = FeS

FE3-12: What is true about the electron configuration of K^1+ , Ca^2+ , and Cl^1- ? Be very specific.

* Answer: Same electron configuration as Argon

FE3-13: When K-42 undergoes radioactive decay, the result is two products, one of which is Ca-42. What is the other product?

* Answer: Beta particle

FE3-14: A catalyst speeds up rxn by lowering activation energy. But, which energy measure will remain unchanged? (potential energy diagram)

* Answer: Heat of Reaction (ΔHrxn)

FE3-15: What type of chemical reaction is represented by: 1 S8 + 8 O2 🡪 8 SO2

* Answer: Synthesis

FE3-16: Balance the following reaction: \_\_LiOH + \_\_CO2 🡪 \_\_Li2CO3 + \_\_H2O

* Answer: 2,1,1,1

FE3-17: Neutralization occurs when 15.0 mL of KOH react with 25.0 mL of HNO3. If molarity of HNO3 is 0.750M, what is the molarity of KOH?

* Answer: MaVa=MbVb 🡪 1.25 M KOH

FE3-18: In a phase diagram of any substance, at which point do solid, liquid, and gas phases exist in equilibrium?

* Answer: Triple Point

FE3-19: Using a solubility curve graph, what is the identity of the substance if 40 g of solute is saturated at 25°C? (Assume in 100 g H2O)

* Answer: Potassium Nitrate (KNO3)

FE3-20: What is the correct chemical formula for sodium sulfate?

* Answer: Na2SO4

FE3-21: In a container, 15.9 L of gas is under 589 kPa of pressure at 56.5°C. If pressure and temp change to STP, what is the new volume?

* Answer: Combined Gas Law 🡪 P1V1/T1 = P2V2/T2 🡪 V2 = 76.6 L

FE3-22: What are the TWO differences between the following isotopes of hydrogen?: H-1 ; H-2 (deuterium) ; H-3 (tritium)

* Answer: # n^0 and mass #

FE3-23: What is the correct name for the acid whose chemical formula is H3N?

* Answer: Hydronitric Acid

FE3-24: Which element is located in Group 2 (IIA) and Period 6 of the periodic table?

* Answer: Barium (Ba)

FE3-25: How many moles are in 325 g of (NH4)2Cr2O7 ?

* Answer: 1.29 moles (NH4)2Cr2O7

FE3-26: Which compound contains the greatest percent of oxygen by mass?  
A) CO2  
B) NO2  
C) SO2  
D) SiO2

* Answer: % Composition 🡪 A) CO2

FE3-27: How many moles of KCl are produced when 4.25 moles of KClO3 decompose? \_\_KClO3 🡪 \_\_KCl + \_\_O2

- Answer: 4.25 mol KCl

FE3-28: How many grams of HgO will be produced when 44 g of Hg react with excess O2? \_\_Hg + \_\_O2 🡪 \_\_HgO

- Answer: 48 g HgO

FE3-29: Which e- transition in hydrogen atom will result in emission of red light?  
A) n=2 to n=3  
B) n=2 to n=4  
C) n=3 to n=2  
D) n=4 to n=2

* Answer: C) n=3 to n=2

FE3-30: Correct order of decreasing mass:  
A) alpha, beta, neutron  
B) alpha, neutron, beta  
C) neutron, beta, alpha  
D) neutron, alpha, beta

* Answer: B) alpha, neutron, beta

FE3-31: Predict the product(s) of this equation (no need to balance): Ba + CuCl2 🡪 ?

* Answer: BaCl2 + Cu

FE3-32: What is the MOST important characteristic of a strong acid in solution?

* Answer: It completely ionizes (dissociates) in solution

FE3-33: What is the net ionic equation (N.I.E.) for the reaction between Pb(NO3)2 and HCl?

* Answer: 1 Pb^2+ (aq) + 2 Cl^1- (aq) 🡪 1 PbCl2 (s)

FE3-34: When combined, two gases have a pressure of 4.0 atm. If one gas has a pressure of 1.5 atm, what is the pressure of the second gas?

* Answer: Dalton’s Law of Partial Pressure 🡪 P2 = 2.5 atm

FE3-35: What compound has the chemical formula P2O5?

* Answer: Diphosphorus Pentoxide

FE3-36: Which elements have the same number of neutrons?  
A) B-10 & C-12  
B) Mn-55 & Fe-56  
C) Ag-108 & Cd-112  
D) Au-197 & Hg-201

* Answer: Mass Number = protons + neutrons 🡪 B) Mn-55 & Fe-56

FE3-37:   
A) Based on the VSEPR theory, what is the molecular geometry of NF3?  
B) Is this molecule polar or nonpolar?

* Answer: A) MG = Trigonal Pyramidal B) Polar (lone pair on central atom)

FE3-38: Which compound is soluble in water?  
A) aluminum sulfide  
B) calcium carbonate  
C) iron (III) hydroxide  
D) potassium sulfate

* Answer: Use solubility rules on reference table 🡪 D) potassium sulfate (aq)

FE3-39: What is the identity of an element with the electron configuration [Xe]6s^2 4f^14 5d^10 6p^1

* Answer: Thallium (Tl)

FE3-40: What is the percent by mass of N in Ca(CN)2?

* Answer: % Comp 🡪 N = 30.4%

FE3-41: What is the molarity of 28.9 g of CaCl2 dissolved in water to make 0.78 L of solution?

* Answer: M=mol/L 🡪 0.33 M CaCl2

FE3-42: The half-life of phosphorus-32 is 14.3 days. How much of a 20.0 g sample of phosphorus-32 will remain after 57.2 days?

* Answer: #H-L = Time/H-L 🡪 1.25 g P-32 remain after 4 half-lives

FE3-43: To increase the temperature of 100. g of H2O(s) from -50.0°C to -10.0°C, how much energy is required?

* Answer: q=mCpΔT 🡪 q = 8.20 x 10^3 J

FE3-44: What is the [H+] of an HCl solution if the pH is measured to be 6.0?

* Answer: [H+] = 10^-pH 🡪 [H+] = 1.0 x 10^-6 M HCl

FE3-45: What type of chemical reaction is represented by: 2 C4H10 + 13 O2 🡪 8 CO2 + 10 H2O

* Answer: Combustion Reaction

FE3-46: If palladium is used as a catalyst in a chemical rxn, how does palladium increase speed of rxn? (think potential energy diagram)

* Answer: A catalyst lowers the activation energy (Ea)

FE3-47: Which pair of substances will likely undergo a single replacement reaction?  
A) Na & BaCl2  
B) Zn & BaCl2  
C) Ca & BaCl2  
D) K & BaCl2

* Answer: Use Activity Series Chart on reference table 🡪 D) K & BaCl2

FE3-48: What is the net ionic equation (N.I.E.) for the reaction between LiBr and AgNO3?

* Answer: N.I.E. = 1 Ag^1+ (aq) + 1 Br^1- (aq) 🡪 1 AgBr (s)

FE3-49: How many molecules are contained in 55.0 g of H2SO4?

* Answer: 3.38 x 10^23 molecules H2SO4

FE3-50: How many grams of KCl are necessary to prepare 1.50 liters of a 0.500 M solution of KCl?

* Answer: 55.9 g KCl