Final Exam Twitter Review #2

FE2-1: Which particle has approximately the same mass as a proton? Alpha, beta, electron, or neutron

- Answer: Neutron

FE2-2: The atomic number is ALWAYS equal to the total number of _____ in the nucleus.

- Answer: Protons

FE2-3: An atom that contains 35 protons, 45 neutrons, and 35 electrons has an atomic number of _____.

- Answer: Atomic Number = 35

FE2-4: What is true about the mass number AND atomic number of all isotopes of a given atom?

- Answer: Different mass number ; same atomic number

FE2-5: The principal quantum # of outermost electron of an atom is n=3. What is the total # of occupied principal energy levels in the atom?

- Answer: 3

FE2-6: An atom contains 25 electrons. When atom is in ground state, how many different principal energy levels will contain electrons?

- Answer: 1s2 2s2 2p6 3s2 3p6 4s2 3d5 → 4 energy levels

FE2-7: Which e- config represents an excited state?
A) 1s2 2s2 2p6 3p1
B) 1s2 2s2 2p6 3s2 3p1
C) 1s2 2s2 2p6 3s2 3p2
D) 1s2 2s2 2p6 3s2

- Answer: A

FE2-8: How many total number of "d" orbitals are in the third energy level?

- Answer: n=3 → 3d^10 → 5 Orbitals

FE2-9: The element in period 2 with the largest atomic radius belongs to which family?

- Answer: A.R. decreases left-to-right across a period → Largest A.R. in Period 2 = Alkali Metal

FE2-10: Which of the following metals will lose electrons most readily? Calcium, Magnesium, Potassium, or Sodium

- Answer: Ionization Energy → I.E. decreases/Reactivity increases top-to-bottom for metals → Potassium

FE2-11: Which sequence places elements in increasing I.E.?
A) H → Li → Na → K
B) I → Br → Cl → F
C) O → S → Se → Te
D) H → Be → Al → Ga

- Answer: I.E. increases left-to-right & decreases top-to-bottom → B

FE2-12: Which atom has the strongest attraction for electrons? Cl, F, Br, or I

- Answer: Electronegativity → F

FE2-13: Which metal will form a compound with the general formula M2CO3 when it combines with a carbonate ion? Be, Al, Ca, or Li

- Answer: Lithium (Li)

FE2-14: What is the correct chemical formula for calcium phosphate?

- Answer: Ca3(PO4)2

FE2-15: What is the chemical name for the compound NiBr2?

- Answer: Nickel (II) Bromide

FE2-16: What is the correct chemical formula for phosphorus pentachloride?

- Answer: PCl5

FE2-17: Which of the following molecules is non-polar? H2O, NH3, CO, or CO2

- Answer: CO2

FE2-18: Carbon tetrafluoride is said to be a _____(polar/nonpolar) molecule with a(n) _____(symmetrical/asymmetrical) distribution of e- .

- Answer: nonpolar ; symmetrical

FE2-19: What is the molecular geometry (shape) of boron trifluoride?

- Answer: MG = Trigonal Planar

FE2-20: What is the molecular geometry (shape) of phosphorus trifluoride?

- Answer: MG = Trigonal Pyramidal

FE2-21: How many moles are represented by 20 grams of calcium carbonate, $CaCO_3$?

- Answer: 0.2 mol $CaCO_3$

FE2-22: What is the empirical formula (E.F.) of a compound that contains 30.4% nitrogen and 69.6% oxygen by mass?

- Answer: EF = NO_2

FE2-23: How many total number of nitrogen atoms are in 0.25 moles of NO_2 gas?

- Answer: 1.5 x 10^23 atoms Nitrogen

FE2-24: How many total molecules are in 34.0 grams of ammonia, NH_3?

- Answer: 1.20 x 10^24 molecules NH_3

FE2-25: Which type of reaction is represented by the following reaction: 1 Mg + 2 $AgNO_3$ → 1 $Mg(NO_3)_2$ + 2 Ag

- Answer: Single Replacement (S.R.)

FE2-26: When balanced, what is the coefficient of O_2 in the following: __C_2H_4 + __O_2 → __CO_2 + __H_2O

- Answer: O_2 → 3

FE2-27: What is the correct formula for the product represented by "X" in the following reaction: K_2CO_3 + $BaCl_2$ → "X" + $BaCO_3$

- Answer: "X" = KCl

FE2-28: Predict the product(s) if given the following reactant, $CaCl_2$.

- Answer: $CaCl_2$ → Ca + Cl_2

FE2-29: How many moles of oxygen (O_2) gas must react completely with the combustion of 5.00 moles of butane gas, C_4H_{10}?

- Answer: 2 C_4H_{10} + 13 O_2 → 8 CO_2 + 10 H_2O = 32.5 mol O_2

FE2-30: How many liters of ammonia gas, NH_3, at STP are produced when 28.0 grams of nitrogen gas is consumed? $N_2(g)$ + $H_2(g)$ → $NH_3(g)$

- Answer: 1,3,2 → 44.8 L $NH_3(g)$

FE2-31: How many grams of oxygen gas, O2, are needed to produce 54 grams of water? H2 + O2 → H2O

- Answer: 2,1,2 → 48 g O2

FE2-32: How many molecules of CO2 are produced when 2.50 moles of C2H6 is consumed?: C2H6 + O2 → CO2 + H2O

- Answer: 2,7,4,6 → 3.01 x 10^24 molecules CO2

FE2-33: A gas occupies 40.0mL at 20°C. If volume increases to 80.0mL at constant pressure, the resulting temperature will be equal to ___.

- Answer: Charles's Law – V1/T1=V2/T2 → T2 = 586K

FE2-34: The temp of a 2.0L sample of helium gas at STP is increased to 27°C and pressure is decreased to 80. kPa. What is the new volume?

- Answer: Combined Gas Law – P1V1/T1=P2V2/T2 → 2.8 L He

FE2-35: What will happen to the volume of an ideal gas if pressure increases and the temperature decreases?

- Answer: Volume Decreases

FE2-36: What will happen to the volume of a gas when the pressure exerted on the gas at constant temperature is doubled? Be very specific.

- Answer: Boyle's Law – P1V1=P2V2 → Volume is halved

FE2-37: When NH4Cl crystals are dissolved in H2O, the temp of H2O decreases. What does this temp change indicate about dissolving NH4Cl?

- Answer: Endothermic Reaction because NH4Cl absorbs heat

FE2-38: When 200. grams of water cools from 50.0°C to 25.0°C, what is the total amount of heat energy released by the water?

- Answer: q=mCpΔT → q = -20,900 J

FE2-39: What is the final temperature of the water when 420 Joules of heat energy is added to 10. grams of water at 20.°C?

- Answer: q=mCpΔT → ΔT=q/mCp → ΔT=Tf – Ti → Tf=ΔT + Ti → 30.°C

FE2-40: How many Joules of heat are needed to completely change 10.0 grams of ice to water at the melting point temperature?

- Answer: q=mΔHf → q=3340 J

FE2-41: According to the Arrhenius theory, when a base dissolves in water it produces ___.

- Answer: Hydroxide (OH-) ions

FE2-42: The pH of an acidic solution is 11. What is the concentration of H+ ions with this pH?

- Answer: [H+]=10^-pH → 1.0 x 10^-11 M

FE2-43: What is the H+ ion concentration of a solution that has an OH- ion concentration of 1.0 x 10^-3 M?

- Answer: [H+][OH-] = 1.0 x 10^-14 M → [H+]=1.0 X 10^-11 M

FE2-44: Students record these observations about an unknown soln: conducts electricity & turns blue litmus paper red. What is unknown soln?

- Answer: Acid

FE2-45: Which type of radioactive emission particle has a positive charge and weak penetrating power? Alpha, beta, gamma, or neutron?

- Answer: Alpha particle

FE2-46: Which type of radioactive decay is represented by "X" in the following: Ra-226 → Rn-222 + "X"

- Answer: Alpha particle

FE2-47: Determine the identity of "X" in the following nuclear reaction: "X" → Pb-208 + alpha particle

- Answer: Po-212

FE2-48: Determine the identity of "X" in the following nuclear reaction: Pa-234 → "X" + beta particle

- Answer: U-234