

Semester End Review for CHEM 161 – Jeopardy like game

“This a game where points don’t matter. Just like a nutritional label on a McDonald’s Happy Meal”

CHAPTER 1

- This is the result of $68.5742 - 64.1682$ answer: What is 4.4060
- mm^3 converts to this many m^3 . answer: What is 10^{-9} ?
- This is the term that refers to how close you got to the true answer answer: accuracy
- Considering the classifications of element, compound, and mixture carbon dioxide would be this answer: compound
- This method of learning utilizes empirical evidence and a self-correcting cyclic process answer: the Scientific Method

CHAPTER 2 – Nuclear Chemistry

- This term describes the number of protons in an atom answer: atomic number
- A heavy decay particle with a low penetration depth. What is an α -particle?
- The number of neutrons that are contained in Cl-37. What is 20?
- The order if penetration depth, from deepest to shallowest for α , β , and γ emission. What is $\gamma \beta \alpha$?
- This type of nuclear reaction is used in current nuclear power plants answer: fission

CHAPTER 3 – Quantum Numbers and Electron Configs

- This happens to the size of the atoms as you move down a column on the periodic table. What is increase?
- This happens to the size of the atoms as you left to right in a row of the periodic table. What is decrease?
- This is the quantum number that specifies the shape of the subshell answer: l q-num
- This is the quantum number that specifies the orientation of the orbital answer: m_l q-num
- When an atom gains an electron, it’s radius does this. What is increase?
- This section of the P-table represents the d subshell answer: transition metals
- The interaction between light and matter that Einstein described whereby electrons are ejected from the surface of metals only when the incident photons are of sufficient frequency. What is the photoelectric effect?
- Elements in the same column of the periodic table have similar chemical properties because of this answer: isoelectronic

CHAPTER 4 – Stoichiometry

- this type of chemical formula shows the simplest whole number ratio between the elements in the compound answer: empirical formula
- this is the molar mass of C_6H_6 answer: 78.108 g/mol
- this is the number of moles 10.00 g of potassium chromate answer: (MM=194.19 g/mol) 0.05150 mol
- given the reaction: $2 \text{C}_4\text{H}_{10} + 13 \text{O}_2 \rightarrow 8 \text{CO}_2 + 10 \text{H}_2\text{O}$ given 10 moles of C_4H_{10} and 50 moles of O_2 , this is the limiting reagent answer: O_2
- given the same reaction and given 10 g of C_4H_{10} and 50 g of O_2 , this is the LR answer: C_4H_{10} (0.688 mol CO_2 vs. 0.9615 mol CO_2)
- given this same reaction, this would be the percent yield if 15.00 g of CO_2 were the yield from the reaction answer: 49.5% (30.28 g theo. yield)

CHAPTER 4 – Nomenclature

- this is the name of NH_4^+ answer: ammonium ion
- this is the name of FeCr_2O_7 answer: iron(II) dichromate
- this is the formula of sulfur dioxide answer: SO_2
- this is the name of hypochlorous acid answer: HClO
- this is the name of $\text{Na}_2\text{SO}_4 \cdot 5 \text{H}_2\text{O}$ answer: sodium sulfate pentahydrate

CHAPTER 5 – Solutions and Colligative Properties

- what is the definition of molality answer: moles solute/kg solvent
- what is the definition of molarity answer: moles of solute/L of solution
- It is the best solute to use on frozen roads to melt the ice among the following: NaCl , glucose, CaCl_2
What is CaCl_2 ?
- this is the concentration of a solution that is made from 5.00 mL of a 0.500 M glucose solution diluted to 500 mL answer: 0.00500 M
- The molar mass of an electrolyte MX_2 which causes a solution containing 29.90g in it in 128.00g of water to freeze at -7.072°C answer: 184.113 g/mol

C5, set #2

100	Answer: Adding a solute to a solvent causes the boiling point of the solvent to do this.	Question: What is increase?
200	Answer: Desalination of ocean water may become economical because of this colligative property	Question: What is osmotic pressure?
300	Answer: This law describes the change in the vapor pressure of a solvent due to the presence of a solute.	Question: What is Raoult's law?
400	Answer: The following substances have these different van't Hoff factors: NaCl , glucose, CaCl_2	Question: What are 2, 1, 3?
500	Answer: If a salty solution and a pure water solution are separated by a membrane, this will happen.	Question: What is "travel through the membrane to dilute the salty solution"?

CHAPTER 6 & 7 – Lewis Structures and VSEPR

- this is the formula for ozone answer: O_3
- The number of valence electrons in NO_2 ? What is 17?
- this is the formal charge of carbon in the carbonate ion answer: zero
- these are the elements that can break the octet rule by accepting more than 8 electrons answer: 3rd row and down
- The orbital shape for the central atom in the following molecules: $\text{ICl}_4(-)$, CS_2 , and $\text{NO}_2(-)$. What are Octahedral, Linear, Trigonal planar?
- The molecular shape for the central atom in the following molecules: $\text{ICl}_4(-)$, CS_2 , and $\text{NO}_2(-)$. What are Square planar, Linear, Bent?
- The polar molecules among the following: SO_3 , SO_2 , I_3^- , PF_5 , PF_3 What are SO_2 , PF_3 ?
- The steric number of each of the following molecules: AsBr_5 , AsBr_3 What are 5 and 4?
- This is the region of the EM spectrum which gets absorbed by some vibrating molecules answer: IR

CHAPTER 8 – Gases

- this type of proportionality between Volume and pressure in an ideal gas answer: inverse
- when temp is increase, this is what happens to the gas particle velocity answer: increase
- true or false: C_2H_6 and Ar act differently as ideal gases according to $PV=nRT$ answer: false
- these are the conditions under which gases act non-ideal answer: high pressure, low temps
- for the same energy, would CO_2 or Ne have the greatest velocity answer: Ne

CHAPTER 9 – Intermolecular Forces

- The substances that will hydrogen bond with molecules of their own kind among the following group: H_2SO_4 , H_3COCH_3 , $\text{H}_2\text{NCH}_2\text{COOH}$, CH_2Cl_2
What are H_2SO_4 , $\text{H}_2\text{NCH}_2\text{COOH}$?
- The substances that will hydrogen bond with water kind among the following group: H_2SO_4 , H_3COCH_3 , $\text{H}_2\text{NCH}_2\text{COOH}$, CH_2Cl_2
What are H_2SO_4 , H_3COCH_3 , $\text{H}_2\text{NCH}_2\text{COOH}$?
- between $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ and $\text{CH}_3\text{CH}_2\text{CH}_3$, which will have the lowest boiling point answer: $\text{CH}_3\text{CH}_2\text{CH}_3$
- The vapor pressure of TeF_6 reaches 400 mm Hg at -49 degrees C. The vapor pressure of SF_6 reaches 400 mm Hg at -73 degrees C. The substance that should evaporate at a slower rate at -65 degrees C. What is TeF_6 ?
- name all six IM forces (subcategories): ion dipole, H-bonding, dipole dipole, ion-induced dipole, dipole-induced dipole, dispersion

Category: Intermolecular Forces

100	Answer: The following molecules display this type of interaction. CO_2 , $\text{CH}_3\text{CH}_2\text{CH}_3$	Question: What are dispersion forces?
200	Answer: This IM force is similar to dipole-dipole forces but stronger, and is weaker than ionic, covalent, or metallic bonds.	Question: What is H-bonding?
300	Answer: H-bonding can only exist when Hydrogen and one of these three elements are present.	Question: What are N, O, or F?
400	Answer: SF_6 (MW=146 g/mol) has a lower boiling point than $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ (MW=72 g/mol) because of what?	Question: What is large surface area or physical size?
500	Answer: As the n quantum number increases, this property of the electron cloud increases.	Question: What is polarizability?