Key

SI Chemistry: Lecture 2 Test Prep

1. **A** gene **is a sequence of codons within a DNA molecule that codes for a single protein.**

2. **What is Beta- Particle Decay?**
   When a neutron changes into a Proton

3. **What is ionization energy?**
   The amount of energy needed to remove an electron from a gaseous atom in it's ground state

4. **Describe the following periodic trends:**

   a. **Ionization energy**
   increases as you move ~~left~~ right + up

   b. **Electronegativity:**
   increases as you move right + up-

5. **State the differences between an alkane, alkene, and an alkyne.**

   a. **alkane** - Single bonds, Saturated
   b. **alkene** - double bonds, unSaturated
   c. **alkyne** - triple bonds, unSaturated.

6. **Which has the same molecular formula, but a different structural formula?**

   a. **Isomer**
   b. **Isotope**
   c. **Branched Hydrocarbon**
   d. **Normal Hydrocarbon** - Straight Chain

7. **What is a polymer?**

   a. A large, long Chain of Molecules made up of smaller repeating units called Monomers.

8. **Describe what an aromatic HydroCarbon is?**
   a. Carbons that contain a benzene ring.

9. **Describe the meaning of a saturated and an unsaturated Hydrocarbon.**
   a. **Saturated-** Single bonds only, 4 bonds per Carbon
   b. **Unsaturated-** Double + triple bonds between carbons

10. **The longest chain of Hydrocarbons**
   a. **Group chain**
   b. **Parent chain**
   c. **Substrate**
   d. **Normal chain**

11. **Describe the three types of carbohydrates**
   a. Monosaccharides- 1
   b. disaccharides- 2
   c. Polysaccharides- Many

12. **Describe the structures of proteins:**
   a. Primary
   b. secondary
   c. tertiary
   d. Quartenary

13. **How is DNA linked together?**
   a. Hydrogen bonding of the bases

A-T
G-C

Purines- A, G
Pyrimidines- C, T, U

14. **Describe what an amine is from chapter 19.**

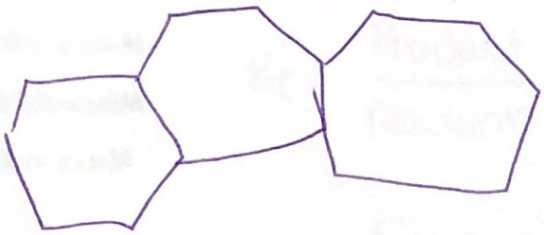
A class of organic compounds that contain Nitrogen

15. **Describe the primary protein structure:**

The order of Amino Acids

16. **Draw a polysaccharide structure:**

a.



17. **How many amino acids are there?**

a. 20

b. 64

c. 32

d. 12

18. **How many codons are there?**

a. 20

b. 62

c. 64

d. 50

19. **What is BioChemistry?**

a. The Study of the Chemical Substances + the Processes ~~they undergo~~ that occur in plants, animals, + Microorganisms

20. **How do reactions proceed?**

a. Adding - Shifts away from addition

removal - Shifts towards addition

21. **Describe transcription and translation:**

a. **Transcription:** DNA → MRNA

b. **Translation:** MRNA → Protein

22. **Calculate the Kc for the balance chemical equation** $2SO_3 \rightleftharpoons 2SO_2 + O_2$

a. $[SO_3] = 0.230$ M

b. $[SO_2] = 0.150$ M

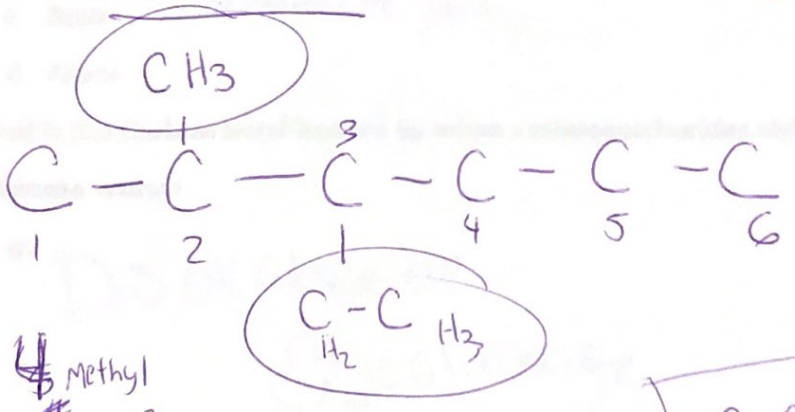
c. $[O_2] = 0.136$ M

$$K_c = \frac{\text{Product}}{\text{reactants}} = \frac{[SO_3]^2}{[SO_2]^2[O_2]}$$

$$= \frac{[0.230]^2}{[0.15]^2[0.136]} =$$

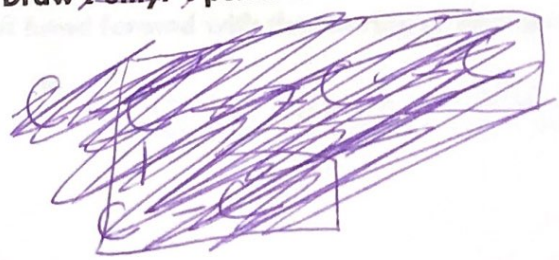
17.29 M

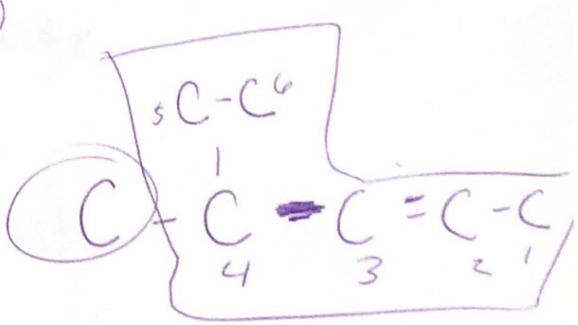
23. **Draw out 3-ethyl-2-methyl hexane**



Methyl

24. **Draw 2-ethyl-3-pentene**





25. **Draw a ketone**

C≡O On the second Carbon.

26. **Draw 1, 3 Dilodobenzene**

27. **A particle with high penetrating power, but low ionizing power:**

   a. **Alpha** - ~~High~~ low Pen, High ion.

   b. **Gamma**

   c. **Beta** - intermediate both

   d. **Atom**

28. **What is the Carbon bond known as when 2 monosaccharides unite and eliminate water?**

   a. Disaccharide - glycolinkage

29. **A bond formed with the sharing of electrons**

   a. Covalent Bond

30. **Describe the degrees of molecular shapes**

a. linear - 180° apart

b. Trigonal Planar - 120° apart

c. tetrahedral - 109.5° apart

d. Bent - 104.5°

31. **When is an ionic bond formed?**

a. nonmetal + metal bond together

32. **Homogeneous mixture of a solute and solution.**

a. **Solvent**

b. **Solution**

c. **Aqueous solution**

d. **Saturated solution**

33. **What is the kinetic molecular theory of gases?**

1. gas Particles move continuously in random straight lines in all directions
2. Particles are tiny w/ great distance between them
3. no energy is lost during collisions
4. Average kinetic energy is the same in all temps.
5. gravitational + attraction forces are negligible

34. **What is molarity?**

a. The number of moles of Solute per Liter of Solution.

35. **A gas mixture has a total pressure of 3.56 atm. The mixture contains 600 moles of C and 425 mole O_2. What are the pressures of each gas separately?**

$P_T = 3.56 atm$

600 mol C 600+425 = 1025 moles

425 mol O_2

$3.56 atm \times 0.54 =$ 2.1 atm C $\frac{600}{1025} = 0.59$ C

$3.56 atm \times 0.41 =$ 1.46 atm O_2 $\frac{400}{1025} = 0.41$ O_2

36. **A balloon has the initial volume of 6.0 liters, and an initial pressure of 36 degrees Celsius. When the balloon is warmed, and has a volume of 9.86 Liters, what is the final temperature of the balloon?**

$V_1 T_2 = V_2 T_1$

$V_1 = 6.0$

$T_1 = 36 + 273 = 309$ K

$V_2 = 9.86$ L

$T_2 = X$

$\frac{(6)(X)}{6} = \frac{(9.86)(309)}{6}$

$X = 507.79 - 273.00$

234.75°C

37. **Calculate the volume of 5.0 moles at STP.**

$PV = nRT$

$(1)(x) = (5)(0.0821)(273)$

$X = 112.07$ L

5 mol | 22.4 L

1 mol

= 112.07 L

38. **How many milliliters of a 7.0 M solution do you need to prepare 600ml of a 0.30M solution?**

$V_a C_a = V_b C_b$

$\frac{(x)(7.0)}{7} = \frac{(600)(0.30M)}{7}$

$X = 25.71$ ml

39. **Describe the pH scale:**

   a. **Below 7:** Acidic

   b. **Above 7:** Alkaline / base

   c. **7:** neutral

40. **Determine the [H_3O^+] concentration if the [OH^-] is 2.1×10^{-11}**

$POH = -\log[OH^-]$

$POH = -\log[2.1 \times 10^{-11}]$

$POH = 10.68$

$PH + POH = 14$

$14 - 10.68 = \boxed{3.32}$

BE SURE TO LOOK OVER NOTES, THE TEST REVIEW ON CANVAS, AND PAST SESSIONS IN PREPARATION FOR THE TEST!!!!!!!!! Review Gas Laws! GOOD LUCK Y'ALL GOT THIS!!!!!!