Name: _____ **Date:** _____

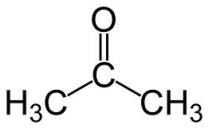
Chemistry *~ Ms. Hart* **Class:** Anions or Cations

THE URBAN ASSEMBLY SCHOOL FOR CRIMINAL JUSTICE

12.4 Organic Reactions - Guided Notes

SPARK: Circle the functional group in the molecules below. Then identify them using Table R!

<table>
<tr>
<td> 



Functional Group:</td>
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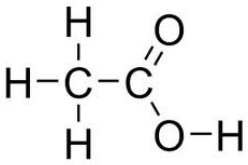

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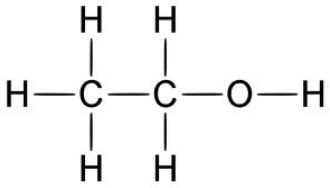

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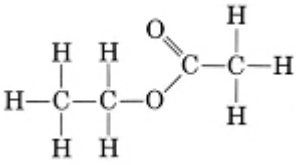
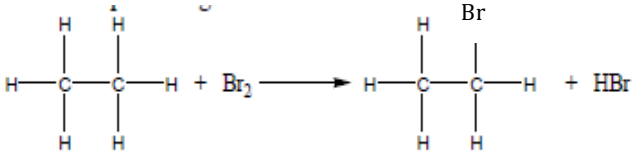
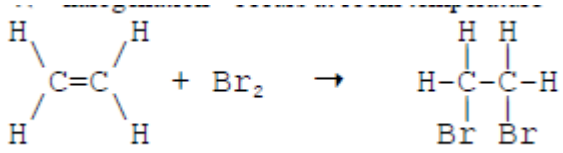


Functional Group:</td>
</tr>
</table>

ORGANIC Reactions

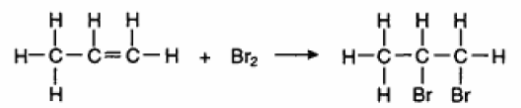
Substitution Reaction	
What is happening?	**Replacement of hydrogen in <u>saturated</u> hydrocarbons**
Formula	
Words	

Addition Reaction	
What is happening?	**Adding two or more atoms to an <u>unsaturated</u> hydrocarbons**
Formula	
Words	

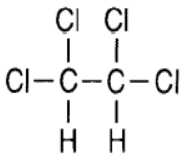
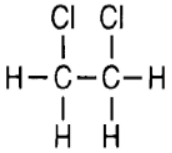
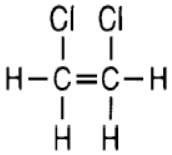
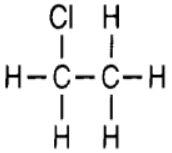
Practice

Organic Reaction	Draw & Determine the Product	Type of Reaction
$C_2H_4 + Cl_2 \rightarrow$		
$C_3H_8 + Br_2 \rightarrow$		
$C_4H_8 + F_2 \rightarrow$		
$C_6H_{14} + Cl_2 \rightarrow$		

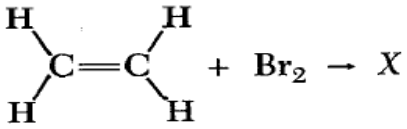
1. The reaction: $C_4H_8 + Cl_2 \rightarrow C_4H_8Cl_2$ is an example of
   (1) substitution (3) polymerization
   (2) addition (4) fermentation
2. The reaction $C_4H_{10} + Br_2 \rightarrow C_4H_9Br + HBr$ is an example of
   (1) substitution (3) fermentation (2) addition (4) polymerization
3. Base your answer to the following question on the organic reaction below



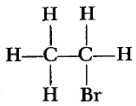
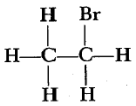
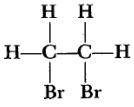
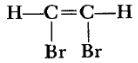
   This reaction is an example of
   (1) Fermentation
   (2) Addition
   (3) Substitution
   (4) saponification
4. Given the balanced equation for an organic reaction: $C_2H_2 + 2Cl_2 \rightarrow C_2H_2Cl_4$
   This reaction is best classified as
   A) addition B) esterification C) fermentation D) substitution
5. Which formula represents the product of the addition reaction between ethene and chlorine, Cl_2?

A)  B)  C)  D) 

6. Which compound can undergo an addition reaction?
   A) CH_4 B) C_2H_4 C) C_3H_8 D) C_4H_{10}
7. As an addition reaction occurs, the number of electrons shared between carbon atoms
   A) decreases B) increases C) remains the same
8. Consider the reaction below:

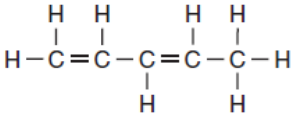


What is the structural formula of the product represented by the *X*?

A)  B)  C)  D) 

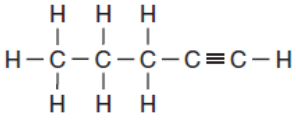
9. Given the equation: $C_2H_6 + Cl_2 \rightarrow C_2H_5Cl + HCl$ This reaction is best described as
   A) addition involving a saturated hydrocarbon
   B) addition involving an unsaturated hydrocarbon
   C) substitution involving a saturated hydrocarbon
   D) substitution involving an unsaturated hydrocarbon
10. Which hydrocarbon will undergo a substitution reaction with chlorine?
   A) methane B) ethyne C) propene D) butene
11. Which equation represents a substitution reaction?
   A) $C_2H_4 + H_2 \rightarrow C_2H_6$
   B) $CH_4 + 2\ O_2 \rightarrow O_2 + 2\ H_2O$
   C) $C_3H_8 + Cl_2 \rightarrow C_3H_7Cl + HCl$
   D) $C_4H_8 + Br_2 \rightarrow C_4H_8Br_2$
12. Two hydrocarbons that are isomers of each other are represented by the structural formulas and molecular formulas below.

Hydrocarbon 1



C_5H_8

Hydrocarbon 2

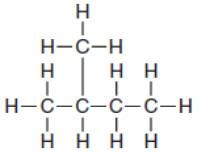


C_5H_8

(a) Explain, in terms of bonds, why these hydrocarbons are unsaturated. [1]

(b) Explain, in terms of structural formulas and molecular formulas, why these hydrocarbons are isomers of each other. [1]

13. The formula below represents a hydrocarbon.

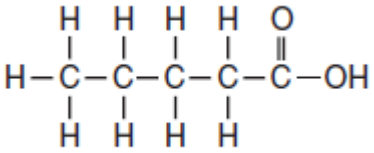


(a) Identify the homologous series to which this hydrocarbon belongs. [1]

(b) Explain, in terms of carbon-carbon bonds, why this hydrocarbon is saturated. [1]

(c) In the space *below*, draw a structural formula for *one* isomer of this hydrocarbon. [1]

14. Given the formula for an organic compound



This compound is classified as a(n)
(1) aldehyde (2) ester (3) amine (4) organic acid

HOMEWORK: Part I due on Tuesday May 27th

Your task is to create flash cards (like real flash cards out of paper!) for ALL major vocabulary words from this year. This can be completed on index cards (preferably) or on slips of paper. I would suggest you get metal book rings if you want to string all of your words together. On one side of the flashcard,

should be the WORD (alone!). The other side should have the definition in your own words and a PICTURE (or equation). If you know the vocabulary, you PASS THE TEST!

Unit 1:

1. Mass
2. Volume
3. Meniscus
4. Significant Figures
5. Density
6. Percent Error

Unit 2:

1. Matter
2. Physical Property
3. Malleable
4. Chemical Property
5. Extensive Property
6. Intensive Property
7. Physical Change
8. Chemical Change
9. Melting Point
10. Freezing Point
11. Boiling
12. Vaporization
13. Evaporation
14. Freezing
15. Condensation
16. Melting
17. Fusion
18. Sublimation
19. Deposition
20. Solid
21. Liquid
22. Gas
23. Heat of vaporization
24. Heat of fusion
25. Temperature
26. Kinetic energy
27. Potential energy
28. Heat
29. Heat capacity
30. Heating/cooling curve
31. Phase
32. Heating curve
33. Cooling curve
34. Colligative property

Unit 3:

1. Atom
2. Element
3. Compound
4. Pure Substance
5. Mixture
6. Homogenous Mixture
7. Heterogeneous Mixture
8. Chemical Formula
9. Subscript
10. Dalton
11. Thomson
12. Cathode Ray Tube
13. Plum Pudding Model
14. Electron
15. Rutherford
16. Gold-Foil Experiment
17. Proton
18. Nucleus
19. Neutron
20. Atomic Mass Unit
21. Atomic Number
22. Mass Number
23. Average Atomic Mass
24. Isotope
25. Percent Abundance
26. Isotopic Notation
27. Ions

Unit 4:

1. Bright Line Spectra
2. Photon
3. Ground State Electron Configuration
4. Excited State Electron Configuration
5. Valence Electrons
6. Lewis Dot Diagram
7. Group on the periodic table
8. Period on the periodic table
9. Families on the periodic table
10. Alkali Metals
11. Alkaline Earth Metals
12. Halogens
13. Noble Gases
14. Metal
15. Nonmetal
16. Metalloid
17. Ionization Energy
18. Electronegativity
19. Atomic Radius
20. Reactivity of elements
21. Ionic Radius
22. Cation
23. Anion

Unit 5:

1. Chemical bond
2. Octet rule
3. Oxidation number
4. Polyatomic ion
5. Ionic compound
6. Covalent compound
7. Ionic bond
8. Covalent compound
9. Polar covalent
10. Non-polar covalent
11. Polar
12. Dipole
13. Metallic bond
14. Intermolecular forces
15. Hydrogen bonds
16. Dipole-dipole forces
17. London dispersion forces
18. Electrolyte

Unit 6:

1. Grams formula mass
2. Molecular formula
3. Empirical formula
4. Subscript
5. Coefficient
6. Percent composition
7. Law of conservation of mass
8. Mole
9. Avogadro's number
10. Synthesis
11. Decomposition
12. Single replacement
13. Double replacement
14. Combustion
15. Activity Series
16. Products
17. Reactants

Unit 7:

1. Collision theory
2. Rate
3. Equilibrium
4. Concentration
5. Surface area
6. Pressure
7. LeChateliers Principle
8. Kinetics
9. Potential energy diagram
10. Heat of Reaction
11. Exothermic
12. Endothermic
13. Activation energy
14. Activated complex
15. Catalyst

We will do the other units for next week!