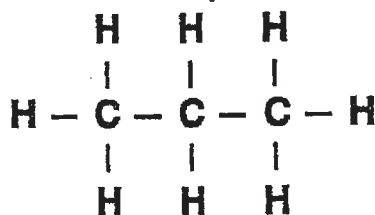


## NAMING HYDROCARBONS

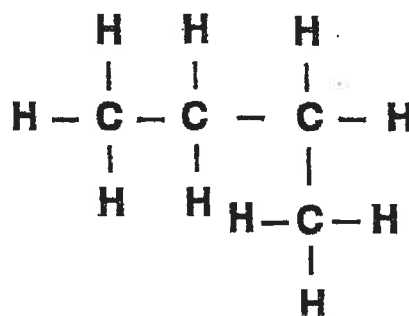
Name \_\_\_\_\_

Name the compounds below according to the IUPAC naming system

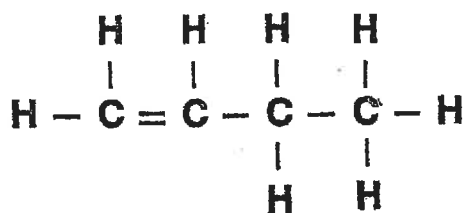
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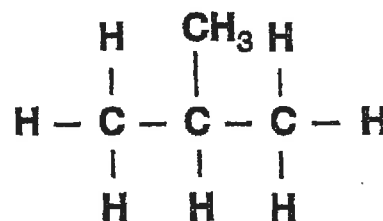
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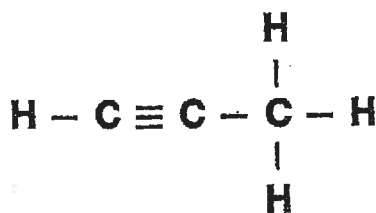
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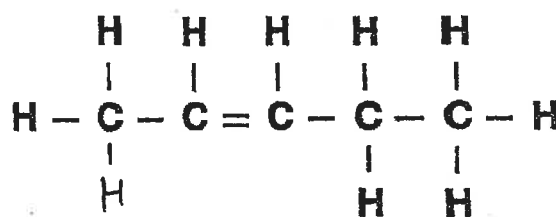
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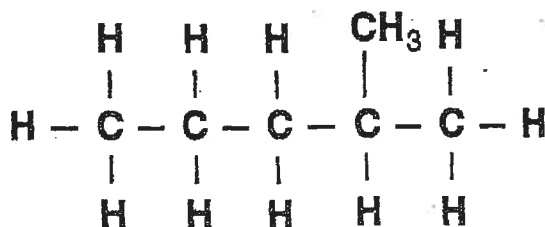
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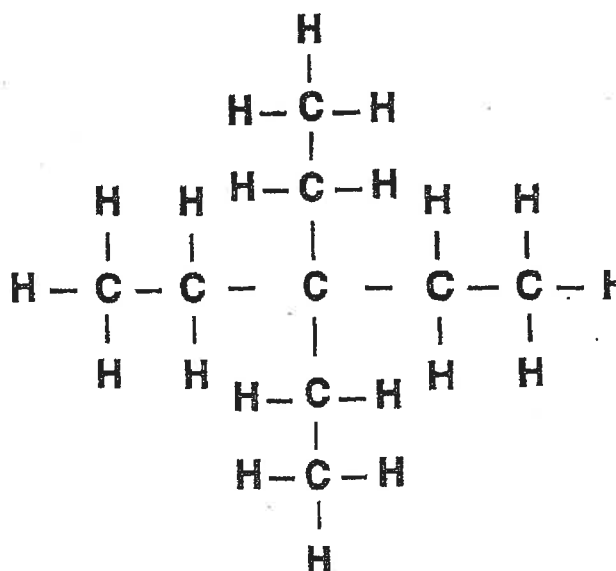
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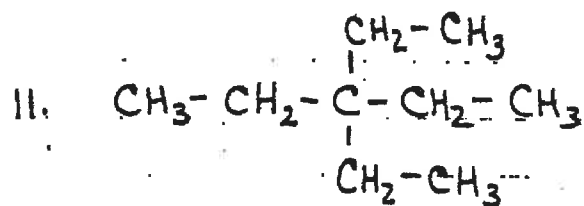
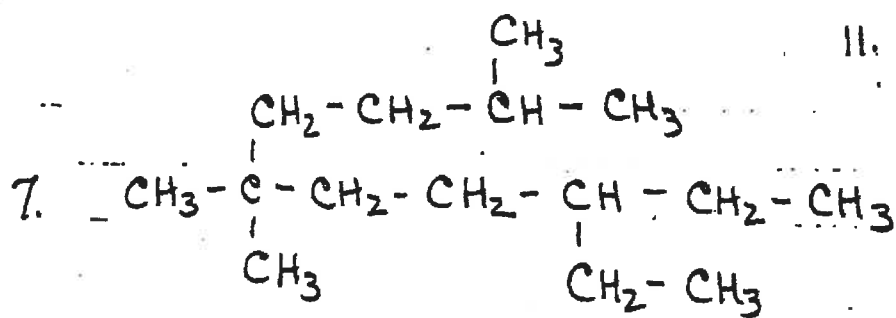
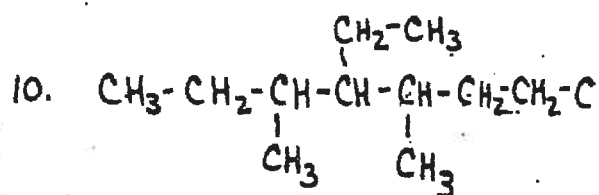
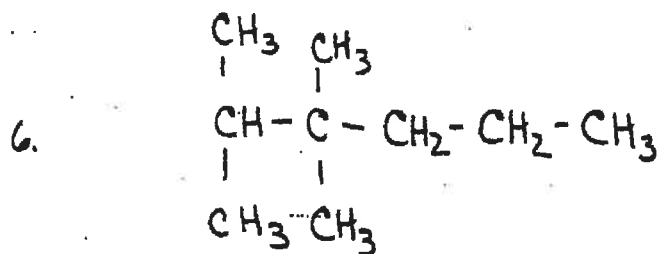
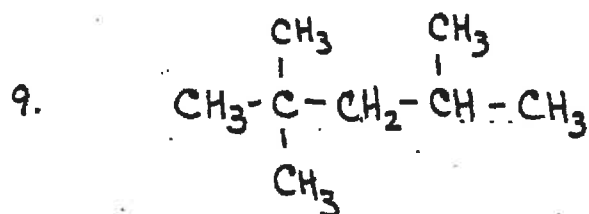
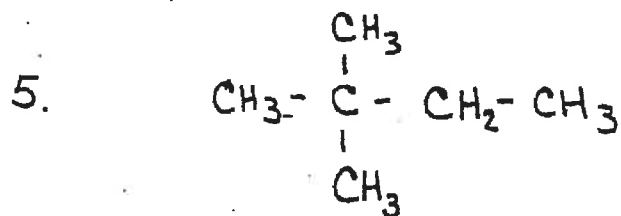
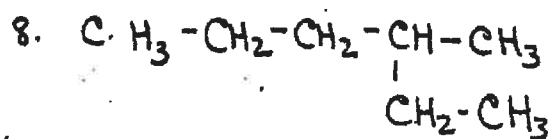
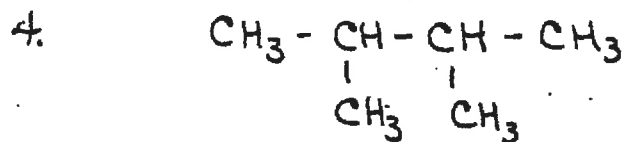
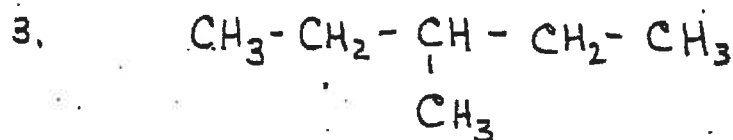
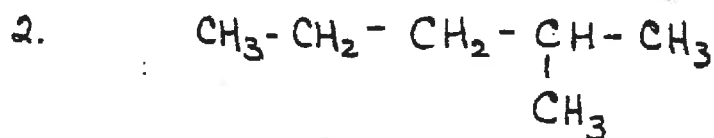
Page 2  
 Regents Chemistry: Alkenes & Alkynes #2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

<u>Name</u>	<u># of C atoms</u>	<u># of H atoms</u>	<u>Chemical Formula</u>	<u>Structural Formula</u>
	2	4		
	3	6		
2-butyne				
			C <sub>2</sub> H <sub>2</sub>	
	3	4		
methyl propene				
			C <sub>5</sub> H <sub>8</sub>	
3-methyl-1-pentyne				
1-butyne				

NAME THESE ALKANES:



**STRUCTURE OF HYDROCARBONS**

Name \_\_\_\_\_

Draw the structure of the compounds below.

1. ethane	5. ethyne
2. propene	6. 3,3-dimethyl pentane
3. 2-butene	7. 2,3-dimethyl pentane
4. methane	8. <i>1</i> -butyne

Which element is present in all organic compounds?

- (1) carbon (3) nitrogen  
(2) oxygen (4) hydrogen

Which statement explains why the element carbon forms so many compounds?

- (1) Carbon atoms combine readily with oxygen.  
(2) Carbon atoms have very high electronegativity.  
(3) Carbon readily forms ionic bonds with other carbon atoms.  
(4) Carbon readily forms covalent bonds with other carbon atoms.

The four single bonds of a carbon atom are directed in space toward the corners of a

- (1) trigonal bipyramid (3) regular octahedron  
(2) square plane (4) regular tetrahedron

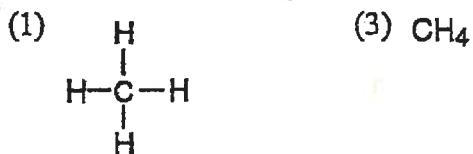
Organic compounds differ from inorganic compounds in that organic compounds generally have

- (1) low melting points and are electrolytes  
(2) low melting points and are nonelectrolytes  
(3) high melting points and are electrolytes  
(4) high melting points and are nonelectrolytes

In general, which property do organic compounds share?

- (1) slow reaction rate  
(2) readily soluble in water  
(3) high electrical conductivity  
(4) high melting point

6. Which representation is the structural formula of an organic compound?



7. As the number of carbon atoms in a hydrocarbon molecule increases, the number of possible isomers generally

- (1) decreases (3) remains the same  
(2) increases

8. Which pair of compounds are isomers?

- (1)  $\text{CH}_3\text{CH}_2\text{OH}$  and  $\text{CH}_3\text{COOH}$   
(2)  $\text{CH}_3\text{CH}_2\text{OH}$  and  $\text{CH}_3\text{OCH}_3$   
(3)  $\text{C}_6\text{H}_6$  and  $\text{C}_6\text{H}_{12}$   
(4)  $\text{C}_2\text{H}_4$  and  $\text{C}_2\text{H}_6$

9. If two compounds are isomers, they must have the same

- (1) boiling point  
(2) vapor pressure  
(3) structure  
(4) percentage composition

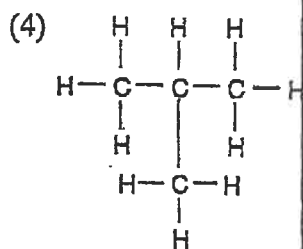
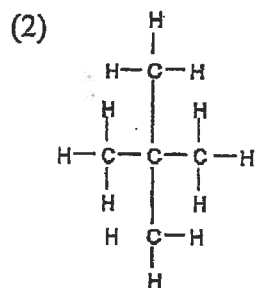
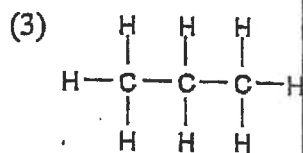
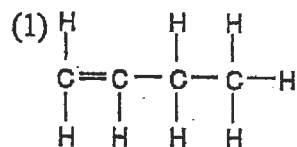
10. Which hydrocarbon has more than one possible structural formula?

- (1)  $\text{C}_4\text{H}_{10}$  (3)  $\text{C}_2\text{H}_6$   
(2)  $\text{C}_3\text{H}_8$  (4)  $\text{CH}_4$

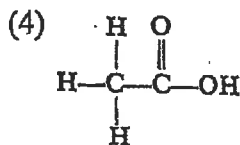
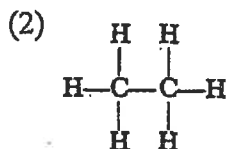
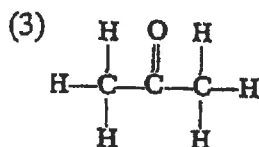
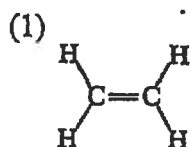
11. What is the maximum number of covalent bonds that can be formed by one carbon atom?

- (1) 1 (3) 3  
(2) 2 (4) 4

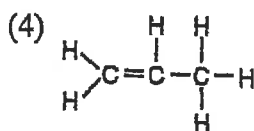
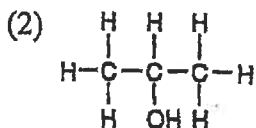
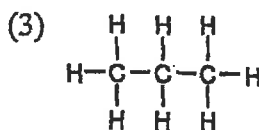
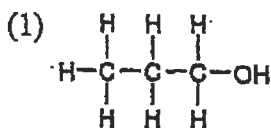
12. Which formula is an isomer of butane?



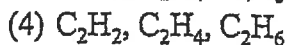
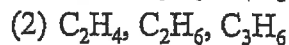
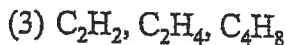
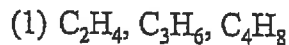
13. Which formula represents an unsaturated hydrocarbon?



14. Which structural formula represents a saturated hydrocarbon?



15. In which group could the hydrocarbons all belong to the same alkene series? *alkene*

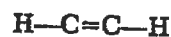


16. Which formula represents a saturated hydrocarbon?

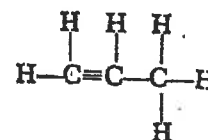


17. Which is the correct structural formula of propene?

(1)



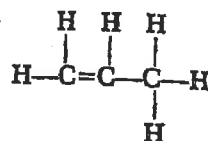
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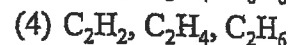
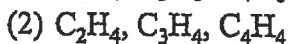
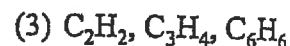
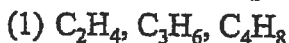
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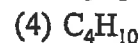
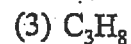
(4)



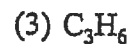
18. Which sequence represents only alkenes?



19. In which compound does a double covalent bond exist between two carbon atoms?



20. Which compound contains a triple bond?



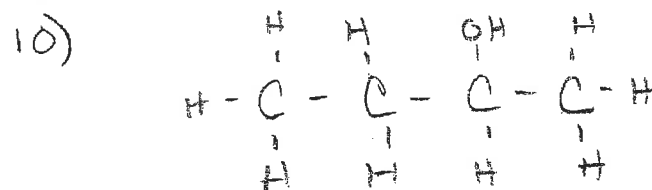
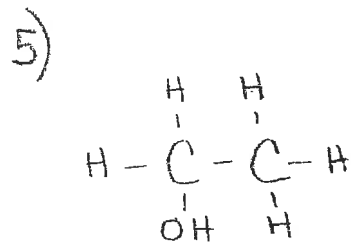
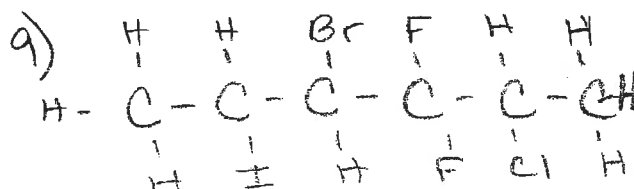
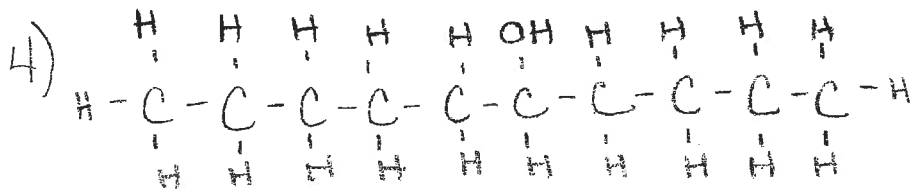
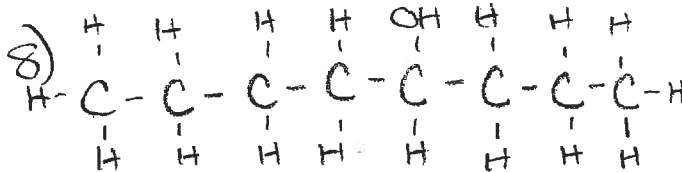
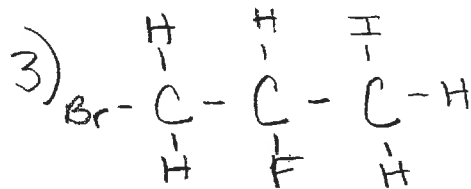
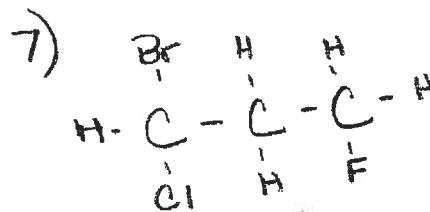
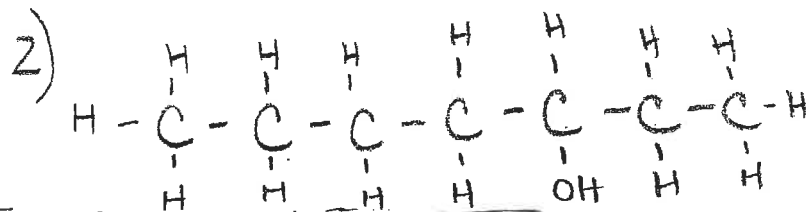
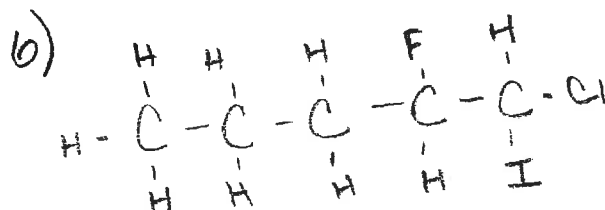
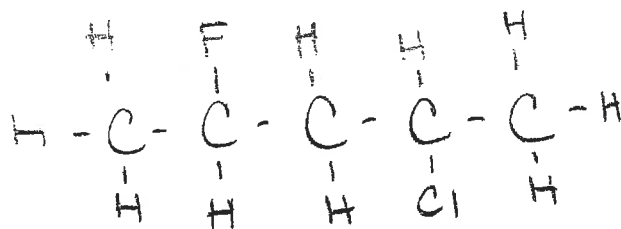
Page 1

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

6.

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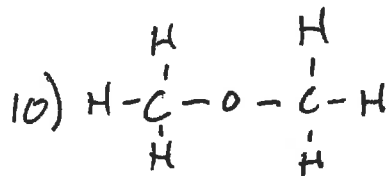
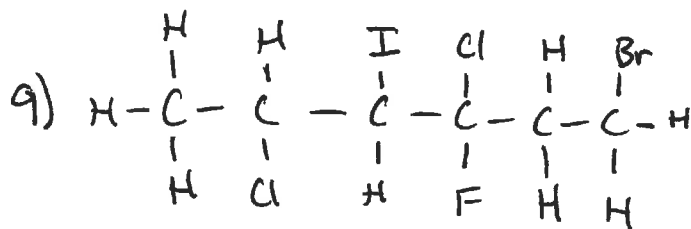
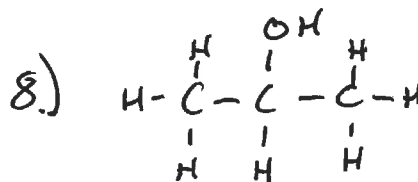
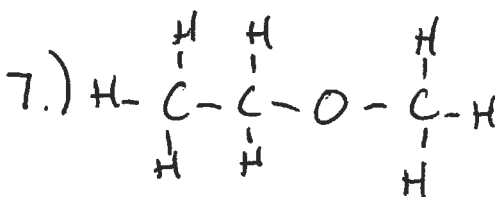
Name \_\_\_\_\_

Halocarbon, alcohol, ether

Draw the following:

1. 1 - pentanol
2. 3 - chlorooctane
3. Ethyl propyl ether
4. Diethyl Ether
5. 2-butanol
6. 3,4-dibromo-2-chloro-2,3,4-trifluoro-1-iodopentane

Name  
the  
following



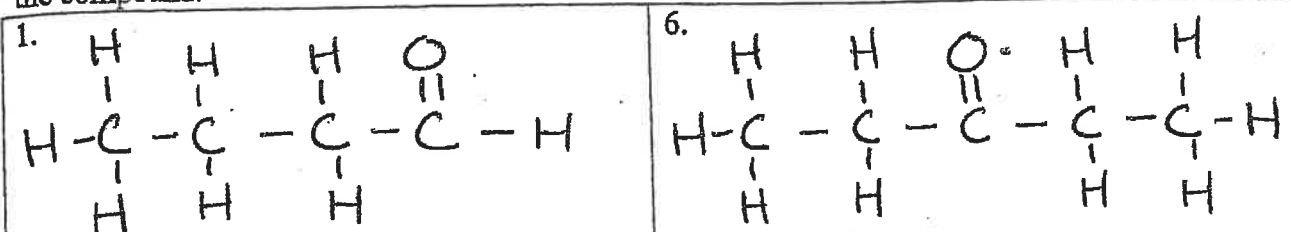
11) How are #'s 7, 8 Related



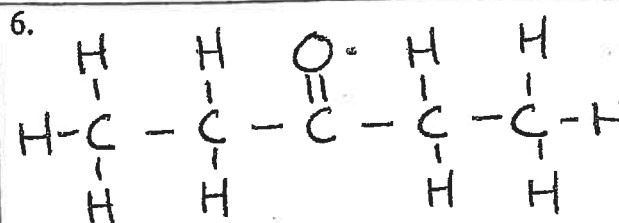
Regents Chemistry: Hydrocarbon Derivatives #1

Name: \_\_\_\_\_ Date: \_\_\_\_\_

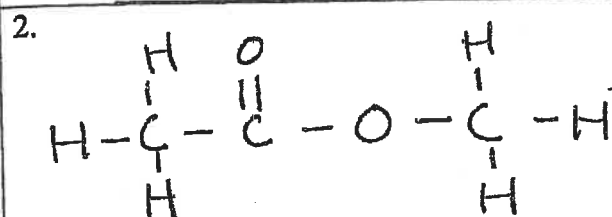
Circle the functional group(s) in each compound below. Identify the functional group. Name the compound.



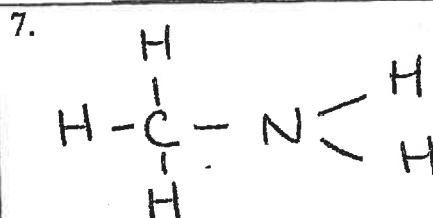
Functional Group: \_\_\_\_\_  
Name: \_\_\_\_\_



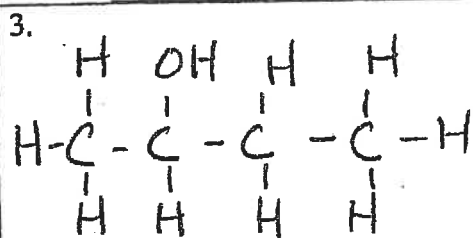
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Name: \_\_\_\_\_



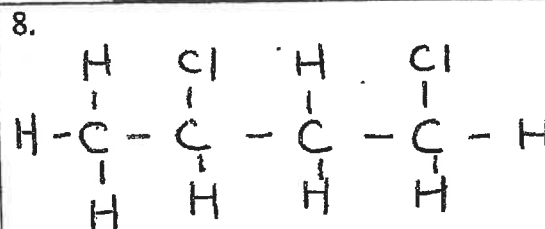
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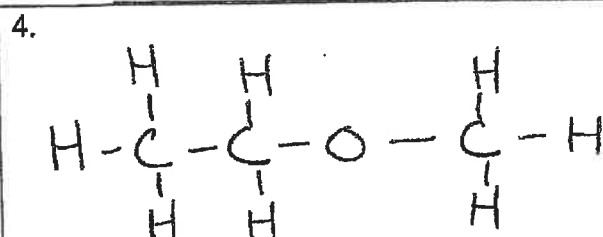
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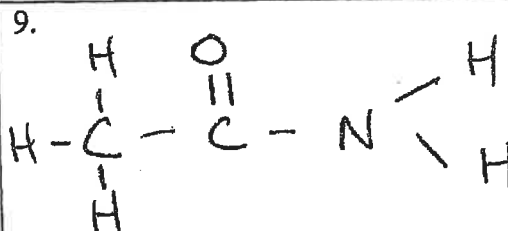
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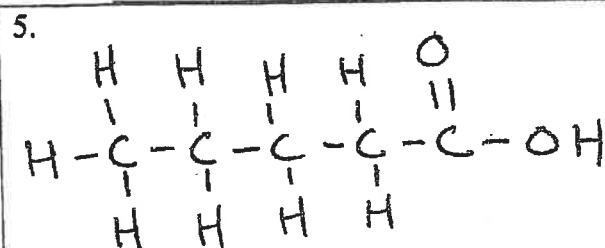
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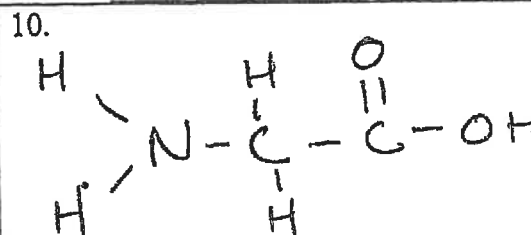
Functional Group: \_\_\_\_\_  
Name: \_\_\_\_\_



Functional Group: \_\_\_\_\_  
Name: \_\_\_\_\_



Functional Group: \_\_\_\_\_  
Name: \_\_\_\_\_



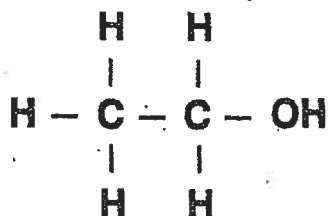
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Name: \_\_\_\_\_

**NAMING OTHER  
ORGANIC COMPOUNDS**

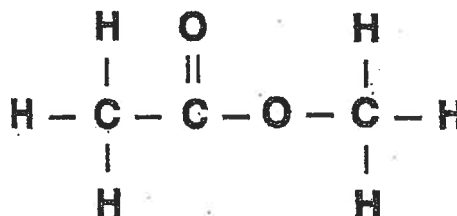
Name \_\_\_\_\_

Name the compounds below.

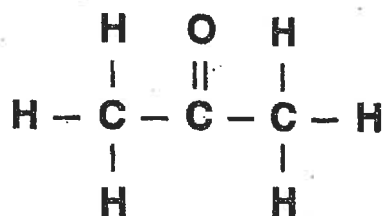
1.



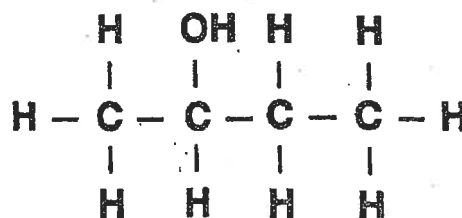
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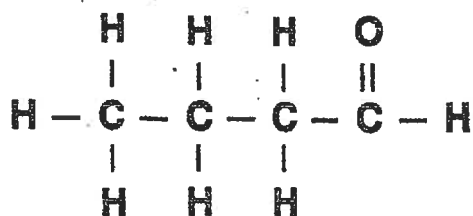
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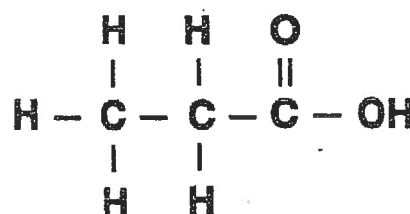
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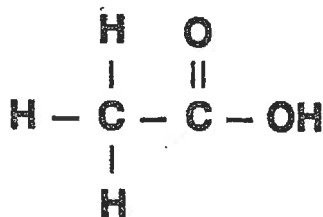
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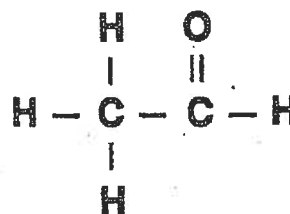
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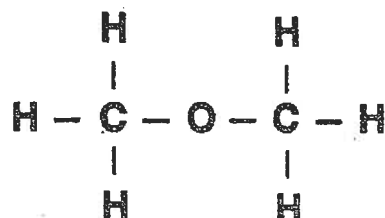
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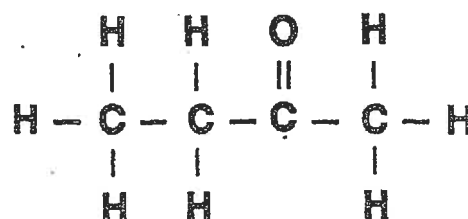
9.



5.



10.



## Regents Chemistry: Hydrocarbon Derivatives

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Classify each of the organic compounds below as an alcohol, carboxylic acid, aldehyde, ketone, ether, or ester, draw its structural formula, and name it.

1. $\text{CH}_3\text{CH}_2\text{OCH}_3$	6. $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$
2. $\text{CH}_3\text{OCH}_3$	7. $\text{CH}_3\text{CH}_2\text{COOH}$
3. $\text{CH}_3\text{COOH}$	8. $\text{CH}_3\text{CH}_2\text{COOCH}_3$
4. $\text{CH}_3\text{COCH}_3$	9. $\text{CH}_3\text{CH}_2\text{COCH}_3$
5. $\text{CH}_3\text{CH}_2\text{OH}$	10. $\text{CH}_3\text{CH}_2\text{CHO}$

IE:

DRAW THESE (32)

Methanol

~~ETHANOL~~

ETHANOL

2-PROPANOL

1,2 ETHANEDIOL

1,2,3 ETHANETRIOL  
propane

3-PENTANOL

METHANAL

ETHANAL

BUTANAL

PROPANONE

2-PENTANONE

2-~~4~~-HEXANONE

METHANOIC ACID

PROPANOIC ACID

HEPTANOIC ACID

METHYL ETHANOATE

ETHYL PROPANOATE

METHYL METHANOATE

METHYL ETHER

METHYL ETHYL ETHER

DIETHYL ETHER

Dimethyl



Name: \_\_\_\_\_

Period: \_\_\_\_\_

Name the compounds to the right

1)	$\text{CH}_3\text{CH}_2\overset{\text{O}}{\parallel}\text{C}-\text{O}-\text{CH}_3$
2)	$\text{CH}_3\text{CH}_2\overset{\text{O}}{\parallel}\text{C}-\text{CH}_3$
3)	$  \begin{array}{ccccccc}  & \text{H} & & \text{O} & & \text{H} & & \text{H} & & \text{H} \\  &   & &    & &   & &   & &   \\  \text{H} & - \text{C} & - & \text{C} & - & \text{C} & - & \text{C} & - & \text{C} & - & \text{H} \\  &   & & & &   & &   & &   \\  & \text{H} & & & & \text{H} & & \text{H} & & \text{H}  \end{array}  $
4)	$  \begin{array}{ccccccc}  & \text{H} & & \text{H} & & & & \text{O} & & \text{H} & & \text{H} & & \text{H} \\  &   & &   & & & &    & &   & &   & &   \\  \text{H} & - \text{C} & - & \text{C} & - & \text{O} & - & \text{C} & - & \text{C} & - & \text{C} & - & \text{H} \\  &   & &   & & & & & &   & &   & &   \\  & \text{H} & & \text{H} & & & & & & \text{H} & & \text{H} & & \text{H}  \end{array}  $
5)	$  \begin{array}{ccccc}  & \text{H} & & \text{O} & & \text{H} \\  &   & &    & &   \\  \text{H} & - \text{C} & - & \text{C} & - & \text{C} & - & \text{H} \\  &   & & & &   \\  & \text{H} & & & & \text{H}  \end{array}  $
6)	ethyl propanoate
7)	butanone
8)	methyl ethanoate
9)	3-hexanone
10)	propyl ethanoate

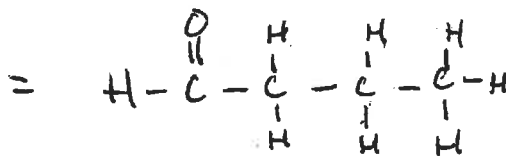
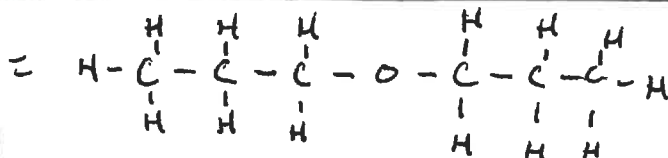
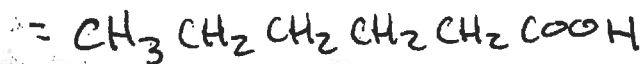
Bonus: what organic acid and what alcohol react to form the ester in question 1?

\_\_\_\_\_ / \_\_\_\_\_

ame.:

Period: \_\_\_\_\_

Name the compounds to the right



Draw the following compounds

methanoic acid

methyl propyl ether

pentanoic acid

ethanal

2 ethanoic acid

Bonus (+1) Draw Salicylic Acid

↳ Not available during corrections:

# ORGANIC RXNS

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Addition	<p>Add Across A Bond 1 of the reactants is an <b>unsaturated</b> hydrocarbon. Get only <b>one</b> product.</p> $\begin{array}{c} \text{H} & & \text{H} \\ & \backslash & / \\ & \text{C} = \text{C} \\ & / & \backslash \\ \text{H} & & \text{H} \end{array} + \text{Cl}_2 \rightarrow \begin{array}{c} \text{H} & \text{H} \\   &   \\ \text{H}-\text{C}-\text{C}-\text{H} \\   &   \\ \text{Cl} & \text{Cl} \end{array}$
Substitution	<p>Swap something for H's. 1 of the reactants is a <b>saturated</b> hydrocarbon. Get <b>two</b> products.</p> $\begin{array}{c} \text{H} & \text{H} \\   &   \\ \text{H}-\text{C}-\text{C}-\text{H} \\   &   \\ \text{H} & \text{H} \end{array} + \text{Cl}_2 \rightarrow \begin{array}{c} \text{H} & \text{H} \\   &   \\ \text{H}-\text{C}-\text{C}-\text{H} \\   &   \\ \text{H} & \text{Cl} \end{array} + \text{HCl}$
Esterification	<p>Organic Acid + Alcohol <math>\rightarrow</math> Ester + <math>\text{H}_2\text{O}</math></p>
Saponification	<p>Making soap. Start with a huge ester and a base (usually NaOH). Produce alcohol and a soap.</p>
Fermentation	<p>Champagne.</p> $\text{C}_6\text{H}_{12}\text{O}_6 \xrightarrow{\text{enzyme}} 2 \text{C}_2\text{H}_5\text{OH} + 2 \text{CO}_2$ <p>Sugar + enzyme catalyst yields carbonated alcohol</p>
Polymerization Addition	<p>Start with <b>unsaturated</b> monomers and get only <b>one</b> product, a polymer with an <b>all C</b> backbone.</p> $\begin{array}{c} \text{H} & & \text{H} \\ & \backslash & / \\ & \text{C} = \text{C} \\ & / & \backslash \\ \text{H} & & \text{H} \end{array} \rightarrow \left[ \begin{array}{c} \text{H} & \text{H} \\   &   \\ -\text{C}- & -\text{C}- \\   &   \\ \text{H} & \text{H} \end{array} \right]_n$
Polymerization Condensation	<p>Monomers contain OH and/or <math>\text{NH}_2</math> groups. Get <b>two</b> products, a polymer and <math>\text{H}_2\text{O}</math>. Polymer has ester or ether links.</p> $\begin{array}{c} \text{H} \\   \\ \text{HO}-\text{C}-\text{OH} \\   \\ \text{H} \end{array} + \begin{array}{c} \text{H} \\   \\ \text{HO}-\text{C}-\text{OH} \\   \\ \text{H} \end{array} \rightarrow \begin{array}{c} \text{H} & \text{H} \\   &   \\ \text{HO}-\text{C}- & -\text{C}-\text{OH} \\   &   \\ \text{H} & \text{H} \end{array}$

Combustion

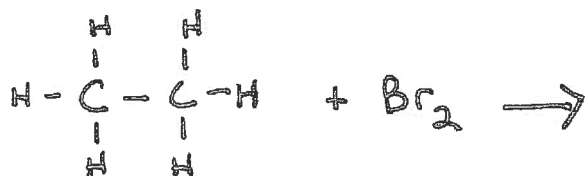
Reaction with  $\text{O}_2$  producing  $\text{CO}_2 + \text{H}_2\text{O}$



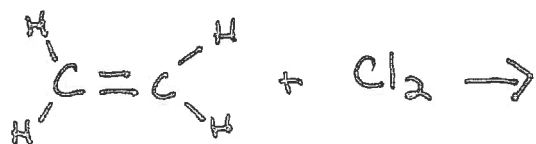
Name: \_\_\_\_\_

Write the Products and Name the Type of Reaction

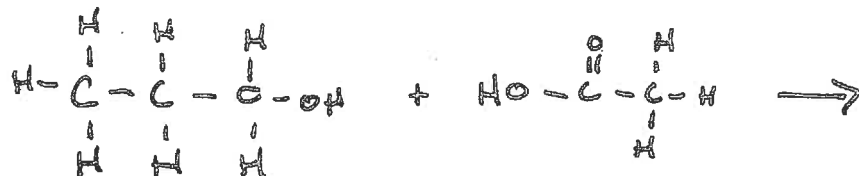
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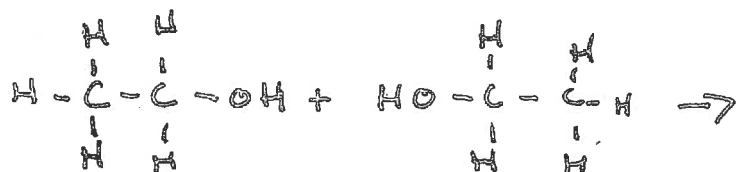
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3



4



5



6

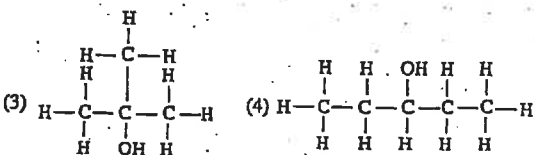
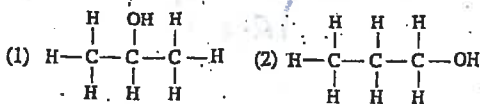


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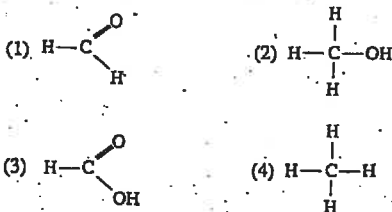




Which is the structural formula of a primary alcohol?



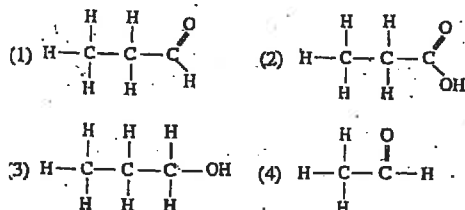
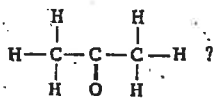
Which is the formula of methanol?



Which formula represents an organic acid? (1)  $\text{HCOOCH}_3$

(2)  $\text{CH}_3\text{CH}_2\text{OH}$  (3)  $\text{CH}_3\text{COCH}_3$  (4)  $\text{HCOOH}$

Which compound is an isomer of propanone



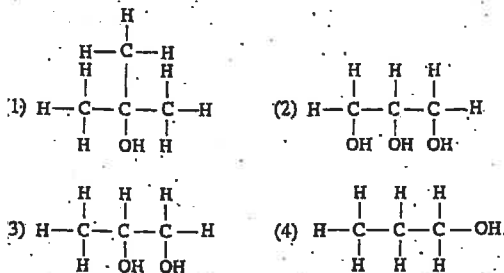
3thers can be synthesized by dehydration of (1) primary alcohols

(2) organic acids (3) organic ketones (4) aldehydes

Which formula represents 1,2-ethanediol? (1)  $\text{C}_2\text{H}_4(\text{OH})_2$

(2)  $\text{C}_2\text{H}_5(\text{OH})_2$  (3)  $\text{Ca}(\text{OH})_2$  (4)  $\text{Co}(\text{OH})_2$

Which structural formula represents a trihydroxy alcohol?



Which statement is true for a compound whose formula is  $\text{H}_3\text{CH}_2\text{COOH}$ ? (1) It is an alcohol. (2) It is an acid. (3) Its solution turns litmus blue. (4) Its solution turns phenolphthalein pink.

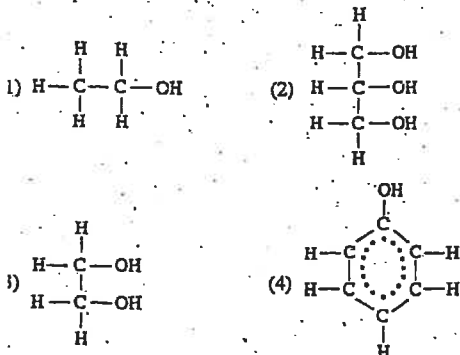
Primary alcohols can be dehydrated to produce (1) ethers

(2) organic acid (3) esters (4) aldehydes

Which class of compounds has the general formula  $\text{R}_1-\text{O}-\text{R}_2$ ?

(1) esters (2) alcohols (3) ethers (4) aldehydes

Which structural formula represents a dihydroxy alcohol?



4. Compared with the rate of an inorganic reaction the rate of an organic reaction is usually (1) faster, because the organic particles are ions (2) faster, because the organic particles are molecules (3) slower, because the organic particles are ionic (4) slower, because the organic particles are molecules

5. Which pair of compounds are isomers?

(1)  $\text{C}_2\text{H}_6$  and  $\text{C}_2\text{H}_{12}$  (2)  $\text{C}_2\text{H}_4$  and  $\text{C}_2\text{H}_6$  (3)  $\text{CH}_3\text{CH}_2\text{OH}$  and  $\text{CH}_3\text{COOH}$  (4)  $\text{CH}_3\text{CH}_2\text{OH}$  and  $\text{CH}_3\text{OCH}_3$

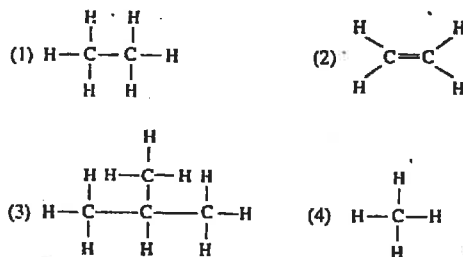
6. Which compound is an isomer of  $\text{C}_4\text{H}_9\text{OH}$ ?

(1)  $\text{C}_3\text{H}_7\text{CH}_3$  (2)  $\text{C}_2\text{H}_5\text{OC}_2\text{H}_5$  (3)  $\text{C}_3\text{H}_7\text{COOC}_2\text{H}_5$  (4)  $\text{CH}_3\text{COOH}$

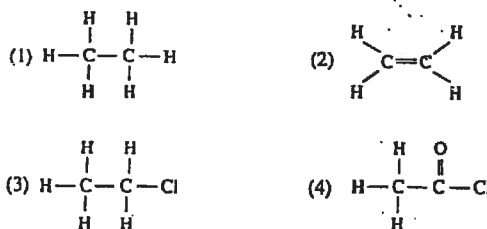
7. As the number of carbon atoms in a hydrocarbon molecule increases, the number of possible isomers generally (1) decreases (2) increases (3) remains the same

8. In the alkane series, each molecule contains (1) only one double bond (2) two double bonds (3) one triple bond (4) all single bonds

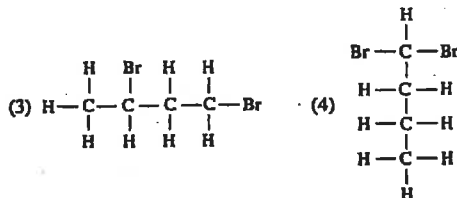
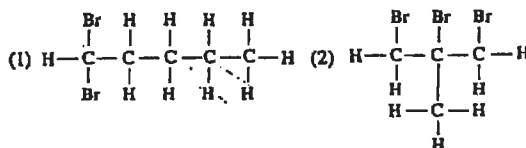
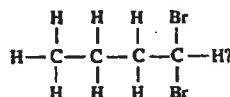
9. Which is the structural formula of methane?



10. Which structural formula represents a saturated hydrocarbon?



27. Which structural formula represents a compound that is an isomer of



15. The type of reaction represented by the equation  $\text{C}_2\text{H}_4 + \text{H}_2 \rightarrow \text{C}_2\text{H}_6$  is called (1) substitution (2) polymerization (3) addition (4) esterification

16. Which reaction is used to produce polyethylene ( $\text{C}_2\text{H}_4$ )<sub>n</sub> from ethylene? (1) addition polymerization (2) substitution (3) condensation polymerization (4) reduction

17. The process of opening double bonds and joining monomer molecules to form polyvinyl chloride is called (1) addition polymerization (2) condensation polymerization (3) dehydration polymerization (4) neutralization polymerization

18. Which hydrocarbon will undergo a substitution reaction with chlorine? (1) methane (2) ethyne (3) propene (4) butene

1. Methanol is classified as a (1) monohydroxy alcohol

(2) secondary alcohol (3) tertiary alcohol (4) dihydroxy alcohol

2. Which compound is an electrolyte?

(1)  $\text{C}_2\text{H}_5\text{OH}$  (2)  $\text{C}_2\text{H}_5(\text{OH})_2$  (3)  $\text{CH}_3\text{OH}$  (4)  $\text{CH}_3\text{COOH}$

2.17

14. What is the minimum number of carbon atoms a ketone may contain? (1) 1 (2) 2 (3) 3 (4) 4

15. Which is the formula for methanoic acid?

(1)  $\text{CH}_3\text{OH}$  (2)  $\text{C}_2\text{H}_5\text{OH}$  (3)  $\text{HCOOH}$  (4)  $\text{HC}_2\text{H}_3\text{O}_2$

16. Which compound is a trihydroxy alcohol?

(1) glycerol (2) butanol (3) ethanol (4) methanol

17. What is the total number of hydroxyl groups contained in one molecule of 1,2-ethanediol? (1) 1 (2) 2 (3) 3 (4) 4

19. Molecules of 1-propanol and 2-propanol have different

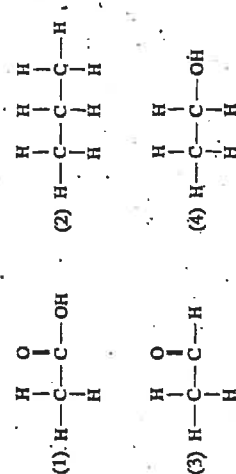
(1) percentage compositions (2) molecular masses

(3) molecular formulas (4) structural formulas

In an aqueous solution, which compound will be acidic?

(1)  $\text{CH}_3\text{COOH}$  (2)  $\text{CH}_3\text{CH}_2\text{OH}$  (3)  $\text{C}_2\text{H}_5(\text{OH})_2$  (4)  $\text{CH}_3\text{OH}$

18. Which structural formula represents an aldehyde?

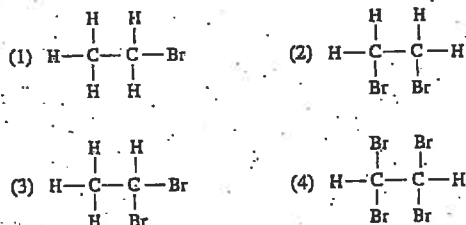
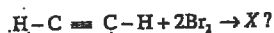


1. A general characteristic of organic compounds is that they all (1) react vigorously (2) dissolve in water (3) are strong electrolytes (4) melt at relatively low temperatures

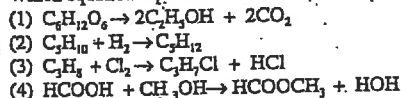
2. All organic compounds must contain the element (1) hydrogen (2) nitrogen (3) carbon (4) oxygen

3. The four single bonds of a carbon atom are spatially directed toward the corners of a regular (1) triangle (2) rectangle (3) square (4) tetrahedron

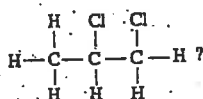
- The organic reaction  $\text{HCOOH} + \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH} \rightarrow \text{HCOOCH}_2\text{CH}_2\text{CH}_2\text{CH}_3 + \text{HOH}$  is an example of (1) fermentation (2) esterification (3) polymerization (4) saponification
- Alkanes differ from alkenes in that alkanes (1) are hydrocarbons (2) are saturated compounds (3) have the general formula  $\text{C}_n\text{H}_{2n}$  (4) undergo addition reactions
- Which molecule is represented by X in the reaction



- Which equation represents an esterification reaction?

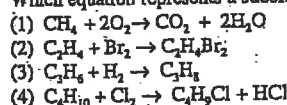


- What is the correct IUPAC name for



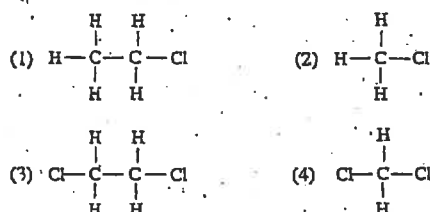
- (1) 1,2-dichlorobutane (2) 2,3-dichlorobutane  
 (3) 1,2-dichloropropane (4) 2,3-dichloropropane

- Which equation represents a substitution reaction?

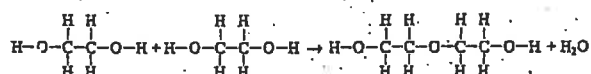


- Which reaction produces ethyl alcohol as one of the principal products? (1) an esterification reaction (2) a neutralization reaction (3) a saponification reaction (4) a fermentation reaction

- Which is the product of the reaction between ethene and chlorine?



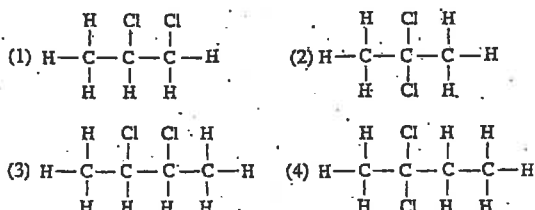
- In which type of reaction are long-chain molecules formed from smaller molecules? (1) substitution (2) saponification (3) fermentation (4) polymerization
- Cellulose is an example of (1) a synthetic polymer (2) a natural polymer (3) an ester (4) a ketone
- A reaction between  $\text{CH}_3\text{COOH}$  and an alcohol produced the ester  $\text{CH}_3\text{COOCH}_3$ . The alcohol used in the reaction was (1)  $\text{CH}_3\text{OH}$  (2)  $\text{C}_2\text{H}_5\text{OH}$  (3)  $\text{C}_3\text{H}_7\text{OH}$  (4)  $\text{C}_4\text{H}_9\text{OH}$
- An alcohol and an organic acid are combined to form water and a compound with a pleasant odor. This reaction is an example of (1) saponification (2) esterification (3) polymerization (4) fermentation
- Given the equation:



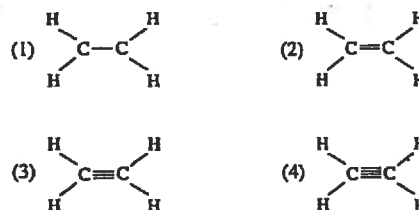
Which type of reaction is represented?

- (1) condensation polymerization (2) addition polymerization  
 (4) esterification (4) saponification

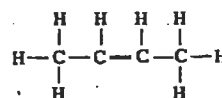
- Which is the formula of 2,2-dichloropropane?



- Which is the structural formula of ethene?

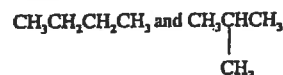


- What is the formula of pentene? (1)  $\text{C}_4\text{H}_8$  (2)  $\text{C}_5\text{H}_{10}$  (3)  $\text{C}_5\text{H}_{12}$  (4)  $\text{C}_5\text{H}_{14}$
- What is the total number of pairs of electrons that one carbon atom shares with the other carbon atom in the molecule  $\text{C}_2\text{H}_4$ ? (1) 1 (2) 2 (3) 3 (4) 4
- Which formula represents an alkene? (1)  $\text{CH}_4$  (2)  $\text{C}_2\text{H}_2$  (3)  $\text{C}_2\text{H}_4$  (4)  $\text{C}_2\text{H}_6$
- In which hydrocarbon series does each molecule contain one triple bond? (1) alkane (2) alkene (3) alkyne (4) benzene
- Which set of formulas represents members of the same homologous series? (1)  $\text{C}$ ,  $\text{CH}_4$ ,  $\text{CH}_3\text{O}$  (2)  $\text{C}_2\text{H}_4$ ,  $\text{C}_3\text{H}_6$ ,  $\text{C}_4\text{H}_8$  (3)  $\text{C}_2\text{H}_2$ ,  $\text{C}_2\text{H}_4$ ,  $\text{C}_2\text{H}_6$  (4)  $\text{CH}_3$ ,  $\text{CH}_2$ ,  $\text{CH}_4$
- Which hydrocarbon is a member of the series with the general formula  $\text{C}_n\text{H}_{2n-2}$ ? (1) ethyne (2) ethene (3) butane (4) benzene
- Given the compound:



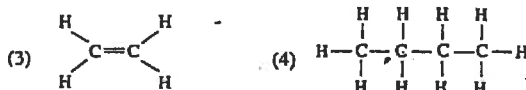
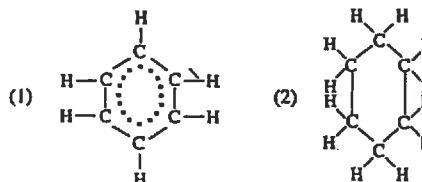
What is the general formula of the hydrocarbon series of which this compound is a member? (1)  $\text{C}_n\text{H}_{2n+2}$  (2)  $\text{C}_n\text{H}_{2n}$  (3)  $\text{C}_n\text{H}_{2n-2}$  (4)  $\text{C}_n\text{H}_{2n-6}$

- Given the compounds:

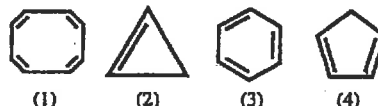


These compounds are both (1) alkynes (2) alkenes (3) isomers of butane (4) isomers of propane

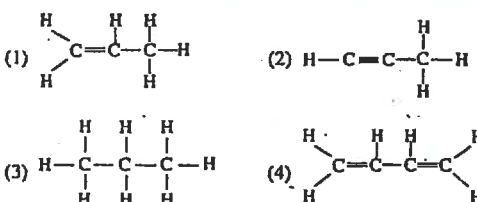
- A compound with the formula  $\text{C}_6\text{H}_6$  is (1) toluene (2) benzene (3) butene (4) pentene
- Which structural formula represents an aromatic hydrocarbon?



- The compound  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$  belongs to the series that has the general formula (1)  $\text{C}_n\text{H}_{2n-2}$  (2)  $\text{C}_n\text{H}_{2n+2}$  (3)  $\text{C}_n\text{H}_{n-6}$  (4)  $\text{C}_n\text{H}_{n+6}$
- Which diagram may be used to represent a benzene ring?

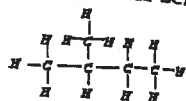


- Which structural formula represents a saturated compound?



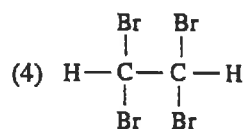
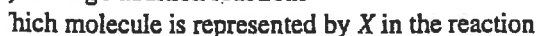
- Which kind of bond is most common in organic compounds? (1) covalent (2) ionic (3) hydrogen (4) electrovalent
- Which is an isomer of  $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$ ? (1)  $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$  (2)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_3$  (3)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$  (4)  $\text{CH}_3\text{COOCH}_2\text{CH}_3$

- A compound that is classified as organic must contain the element  
(1) carbon (2) nitrogen (3) oxygen (4) hydrogen
- What is the geometric shape of a methane molecule?  
(1) triangular (2) rectangular (3) octahedral (4) tetrahedral
- In a molecule of  $\text{CH}_4$ , the hydrogen atoms are spatially oriented toward the corners of a regular  
(1) pyramid (2) tetrahedron (3) square (4) rectangle
- Compared to the rate of inorganic reactions, the rate of organic reactions generally is  
(1) slower because organic particles are ions  
(2) slower because organic particles contain covalent bonds  
(3) faster because organic particles are ions  
(4) faster because organic particles contain covalent bonds
- Which is the general formula for the alkane series of hydrocarbons?  
(1)  $\text{C}_n\text{H}_{2n+2}$  (2)  $\text{C}_n\text{H}_{2n}$  (3)  $\text{C}_n\text{H}_{2n-2}$  (4)  $\text{C}_n\text{H}_{2n-6}$
- Which is a saturated hydrocarbon?  
(1) ethene (2) ethyne (3) propene (4) propane
- Which structural formula represents a molecule of butane?  
(1)  $\begin{array}{c} \text{H H H H} \\ | | | | \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{C}-\text{H} \\ | | | | \\ \text{H H H H} \end{array}$  (2)  $\begin{array}{c} \text{H H H H} \\ | | | | \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{C}-\text{H} \\ | | | | \\ \text{H H H H} \end{array}$  (3)  $\begin{array}{c} \text{H H H H} \\ | | | | \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{C}-\text{H} \\ | | | | \\ \text{H H H H} \end{array}$  (4)  $\begin{array}{c} \text{H H} \\ | | \\ \text{H}-\text{C}=\text{C}-\text{C}-\text{C}-\text{H} \\ | | | | \\ \text{H H H H} \end{array}$
- Which compounds are isomers?  
(1)  $\text{CH}_3\text{Br}$  and  $\text{CH}_2\text{Br}_2$  (2)  $\text{CH}_3\text{OH}$  and  $\text{CH}_3\text{CH}_2\text{OH}$  (3)  $\text{CH}_3\text{OH}$  and  $\text{CH}_3\text{CHO}$  (4)  $\text{CH}_3\text{OCH}_3$  and  $\text{CH}_3\text{CH}_2\text{OH}$
- Which pair of compounds are isomers?  
(1)  $\text{C}_2\text{H}_6$  and  $\text{C}_6\text{H}_{12}$  (2)  $\text{C}_2\text{H}_4$  and  $\text{C}_2\text{H}_6$  (3)  $\text{CH}_3\text{CH}_2\text{OH}$  and  $\text{CH}_3\text{COOH}$  (4)  $\text{CH}_3\text{CH}_2\text{OH}$  and  $\text{CH}_3\text{OCH}_3$
- Which of the following hydrocarbons has the *lowest* normal boiling point?  
(1) ethane (2) propane (3) butane (4) pentane
- The compound  $\text{C}_4\text{H}_{10}$  belongs to the series of hydrocarbons with the general formula  
(1)  $\text{C}_n\text{H}_{2n}$  (2)  $\text{C}_n\text{H}_{2n+2}$  (3)  $\text{C}_n\text{H}_{2n-2}$  (4)  $\text{C}_n\text{H}_{2n-6}$
- Which compound is a saturated hydrocarbon?  
(1) ethane (2) ethene (3) ethyne (4) ethanol
- What is the correct name for the substance below?

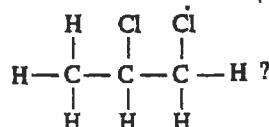


- (1) ethanol (2) 2-methyl butane (3) 2-ethyl pentane (4) butane
- Which is the correct name for the substance below?  
 $\begin{array}{c} \text{H H} \\ | | \\ \text{H}-\text{C}-\text{C}-\text{H} \end{array}$   
(1) ethanol (2) ethyne (3) ethane (4) ethene
- Which structural formula correctly represents 2-butene?  
(1)  $\begin{array}{c} \text{H H H H} \\ | | | | \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{C}-\text{H} \\ | | | | \\ \text{H H H H} \end{array}$  (2)  $\begin{array}{c} \text{H H H H} \\ | | | | \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{C}-\text{H} \\ | | | | \\ \text{H H H H} \end{array}$  (3)  $\begin{array}{c} \text{H H} \\ | | \\ \text{H}-\text{C}=\text{C}-\text{C}-\text{C}-\text{H} \\ | | | | \\ \text{H H H H} \end{array}$  (4)  $\begin{array}{c} \text{H H} \\ | | \\ \text{H}-\text{C}-\text{C}=\text{C}-\text{C}-\text{H} \\ | | | | \\ \text{H H H H} \end{array}$
- What is the formula of pentene?  
(1)  $\text{C}_4\text{H}_8$  (2)  $\text{C}_4\text{H}_{10}$  (3)  $\text{C}_5\text{H}_{10}$  (4)  $\text{C}_5\text{H}_{12}$
- Which of the following hydrocarbons has the *highest* normal boiling point?  
(1) butene (2) ethene (3) pentene (4) propene
- Alkenes *differ* from alkanes in that alkenes  
(1) are hydrocarbons (2) are saturated compounds (3) have the general formula  $\text{C}_n\text{H}_{2n}$  (4) undergo addition reactions
- In which pair of hydrocarbons does each compound contain only one double bond per molecule?  
(1)  $\text{C}_2\text{H}_2$  and  $\text{C}_2\text{H}_4$  (2)  $\text{C}_2\text{H}_2$  and  $\text{C}_3\text{H}_6$  (3)  $\text{C}_4\text{H}_8$  and  $\text{C}_2\text{H}_4$  (4)  $\text{C}_6\text{H}_8$  and  $\text{C}_7\text{H}_{12}$
- Which hydrocarbon is a member of the series with the general formula  $\text{C}_n\text{H}_{2n}$ ?

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What is the correct PUPAC name for



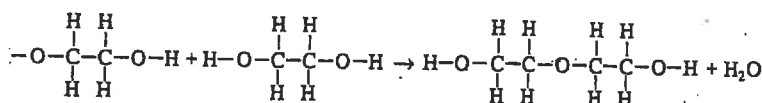
- ) 1,2-dichlorobutane      (2) 2,3-dichlorobutane  
 ) 1,2-dichloropropane    (4) 2,3-dichloropropane

$$) \text{C}_4\text{H}_{10} + \text{Cl}_2 \rightarrow \text{C}_4\text{H}_9\text{Cl} + \text{HCl}$$

high reaction produces ethyl alcohol as one of the principal products? (1) an esterification reaction (2) a neutralization reaction (3) a saponification reaction (4) a fermentation reaction

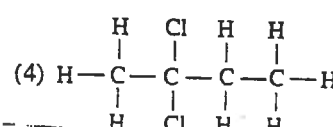
(4)  $\begin{array}{c} \text{H} \\ | \\ \text{Cl}-\text{C}-\text{Cl} \\ | \\ \text{H} \end{array}$

9. In which type of reaction are long-chain molecules formed from smaller molecules? (1) substitution (2) saponification (3) fermentation (4) polymerization
10. Cellulose is an example of (1) a synthetic polymer (2) a natural polymer (3) an ester (4) a ketone
1. A reaction between  $\text{CH}_3\text{COOH}$  and an alcohol produced the ester  $\text{CH}_3\text{COOCH}_3$ . The alcohol used in the reaction was (1)  $\text{CH}_3\text{OH}$  (2)  $\text{C}_2\text{H}_5\text{OH}$  (3)  $\text{C}_3\text{H}_7\text{OH}$  (4)  $\text{C}_4\text{H}_9\text{OH}$
2. An alcohol and an organic acid are combined to form water and a compound with a pleasant odor. This reaction is an example of (1) saponification (2) esterification (3) polymerization (4) fermentation
3. Given the equation:



(1) condensation polymerization (2) addition polymerization  
(4) esterification (4) saponification

14. Which is the formula of 2,2-dichloropropane?



Name It's 1-10

- $$\text{CH}_3-\overset{\underset{\text{CH}_3}{|}}{\text{CH}}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2$$

- $$2. \quad \begin{array}{ccccccc} & & & & \text{CH}_2 - \text{CH}_3 \\ & & & | & \\ \text{CH}_3 - \text{CH}_2 - & \text{CH}_2 - & \text{CH} - & \text{CH}_2 - & \text{CH}_2 - & \text{CH}_2 - & \text{CH}_2 - \text{CH}_3 \end{array}$$

3.  $\text{CH}_3-\text{CH}_2-\text{CH}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_3$   
 $\quad \quad \quad |$   
 $\quad \quad \quad \text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_3$

4.  $\text{CH}_3-\text{CH}-\text{CH}_2-\text{CH}_3$   
|  
 $\text{CH}_3$

- $$5. \quad \begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 - \text{CH}_2 - \text{CH} - \text{CH}_2 - \text{CH}_2 - \text{CH}_3 \end{array}$$

6.  $\text{CH}_3 - \text{CH}_2 - \underset{\text{CH}_3}{\text{CH}} - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$

- $$7. \quad \text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \underset{\begin{array}{c} | \\ \text{CH}_2 - \text{CH}_3 \end{array}}{\text{CH}} - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2$$

8.  $\text{CH}_3 - \text{CH}_2 - \underset{\text{CH}_2 - \text{CH}_3}{\text{CH}} - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$

9.  $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \underset{\text{CH}_3}{\text{CH}} - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$

- $$\text{CH}_3 - \text{CH} - \text{CH} - \text{CH}_3$$