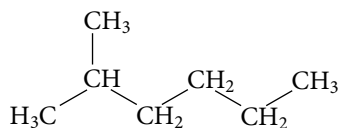


Chapter 1 SELF-ASSESSMENT

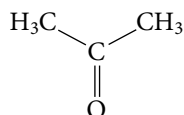
Select the letter of the best answer below.

- K/U** Which molecule would be considered inorganic?
 - H_2CO_3
 - C_2H_2
 - CH_4
 - $\text{C}_3\text{H}_6\text{O}$
 - $\text{C}_2\text{H}_7\text{N}$
- K/U** Stereoisomers have the same
 - molecular formula but different connections between the atoms.
 - molecular mass but different molecular formulas.
 - molecular formula and connectivity between the atoms but differ in the three-dimensional orientation of the atoms.
 - number of carbon atoms but differ in the number of hydrogen atoms.
 - number of carbon and hydrogen atoms but differ in their substituents or functional groups.
- K/U** Which forms enantiomers?
 - C_2H_6
 - CH_3Cl
 - $\text{C}_2\text{H}_2\text{F}_2$
 - $\text{C}_2\text{H}_2\text{FCl}$
 - BrCHClF
- K/U** Which statement is *true*?
 - Alkenes contain only single-bonded carbons and alkynes contain at least one double bond.
 - Alkanes contain only single-bonded carbons and alkynes contain at least one double bond.
 - Alkynes contain only single-bonded carbons and alkenes contain at least one double bond.
 - Alkynes contain only single-bonded carbons and alkenes contain at least one double bond.
 - Alkanes contain only single-bonded carbons and alkynes contain at least one triple bond.
- K/U** Which is the general formula for a straight-chain saturated hydrocarbon?
 - C_nH_n
 - C_nH_{2n}
 - $\text{C}_{2n}\text{H}_{2n}$
 - $\text{C}_n\text{H}_{2n+2}$
 - $\text{C}_n\text{H}_{2n-2}$
- K/U** The general formula $\text{C}_n\text{H}_{2n-2}$ represents which type of hydrocarbon?
 - alkane
 - alkene
 - alkyne
 - benzene
 - cyclic alkane

- K/U** Which is the *root* name for the following molecule?



- hex-
 - hept-
 - pent-
 - prop-
 - sept-
- K/U** Into which group would the following molecule be classified?



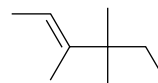
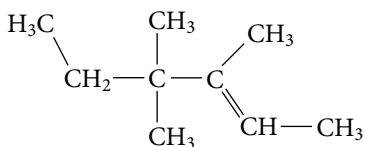
- alcohol
 - aldehyde
 - ketone
 - ester
 - ether
- K/U** Which functional group is shown below?



- haloalkane
 - primary amide
 - secondary amine
 - carboxylic acid
 - secondary amide
- K/U** An amide can be thought to be the product of which two groups?
 - carboxylic acid and ether
 - amine and ether
 - alcohol and amine
 - ester and amine
 - carboxylic acid and amine

Use sentences and diagrams as appropriate to answer the following questions.

- T/I** Would the two molecules represented below be considered constitutional isomers? Explain your reasoning.



12. **C** Draw and name all the diastereomers that could be made using the formula C_6H_{12} .
13. **T/I** Identify which of the following molecules are named incorrectly. Explain your reasoning. Provide the proper name when necessary.
- 2-ethylpropane
 - 3,4-dimethylpentane
 - 3-ethyl-2-methyloctane
 - 2-methyl-3-ethylhept-4-ene
14. **A** Identify an unsubstituted alkane in each state listed below that could be found in the home. What would each example you identified be used for and how long would you expect its carbon chain to be?
- solid
 - liquid
 - gas
 - cyclic alkene
 - aromatic
15. **C** Name, draw, and write the molecular formula for a six-carbon chain for each type of hydrocarbon listed below.
- branched alkane
 - cyclic alkane
 - branched alkyne
 - cyclic alkene
 - aromatic
16. **T/I** Explain why benzene is drawn differently than other cyclic alkanes.
17. **C** Name the following molecules.
- -
18. **C** Draw condensed structural formulas for the following molecules.
- 3-ethylpentan-2-one
 - 2-ethoxy-3-methylhexane
 - N-propylethanamide
19. **K/U** Compare and contrast esters and amides in terms of their structures, how they are named, and their physical properties.
20. **A** Oxalic acid is found in the leaves of some plants, such as rhubarb. Its structure is shown on the right.
-
- Suggest a possible name using IUPAC terminology.
 - What state of matter would you expect it to be at room temperature and why?
 - What solvents would you expect it to dissolve in and why?
21. **T/I** Draw and name all the constitutional isomers that could have the molecular formula C_3H_8O .
22. **A** Is cyclopentane an isomer of pentane? Explain your reasoning.
23. **C** Prepare a 5-min presentation about alkanes, alkenes, and alkynes for a group of Grade 8 students. Assume students have basic knowledge of the periodic table and how atoms bond. Include diagrams as needed in your presentation.
24. **T/I** The common name for 2-propanol is isopropyl alcohol. It is also known as rubbing alcohol. 2-propanol is often added to gasolines in Canada to prevent ice from forming in fuel lines. Otherwise, ice forms as a result of condensed water that is naturally present in the air.
- Draw the molecule.
 - Describe why it can mix with both a polar substance, such as water, and non-polar substances, such as the alkanes in gasoline.
 - What precautions could one take to prevent water from condensing in gas tanks?
25. **A** Humans use hydrocarbons for many purposes.
- What is the source of hydrocarbons we use?
 - Identify problems associated with using this source.
 - What alternative sources could be used to achieve similar results?

Self-Check

If you missed question...	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Review section(s)...	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2