

## Assessment

## Chapter 1

## BLM 1-5

## Organic Compounds Test

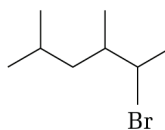
## Goal

Assess students' knowledge of organic compounds.

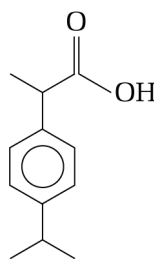
## Procedure

Circle the letter of the correct answer.

- Which of the following compounds is saturated?  
 (a) propene (b) octane (c) 3-heptyne (d) 2-butene (e) 1-butene
- Which formula represents an alkyne?  
 (a)  $C_5H_8$  (b)  $C_5H_{12}$  (c)  $C_5H_{16}$  (d)  $C_5H_{14}$  (e)  $C_5H_{10}$
- What is the total number of covalent bonds in a molecule of  $C_4H_{10}O$ ?  
 (a) 10 (b) 12 (c) 14 (d) 16 (e) 18
- What is the name of the alkyl group containing three carbon atoms?  
 (a) diphenyl (b) trimethyl (c) propyl (d) methyl (e) butyl
- What is the IUPAC name of the following molecule?

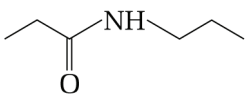


- 2-bromo-4-isopropyl-3-methylbutane
  - 2-bromo-3,5-dimethylhexane
  - 3,4-dimethyl-2-bromohexane
  - 2-bromo-3-methyl-4-propylbutane
  - 2-bromo-3,5-dimethylheptane
- Ibuprofen is a common analgesic. What relation do the two branches on the benzene ring in Ibuprofen have to each other?

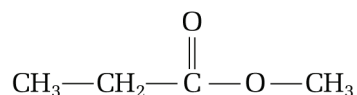


- ortho
- para
- meta
- trans
- cis

7. Which of the following compounds is considered to be non-polar?
- (a)  $\text{CH}_3\text{CH}_2\text{OH}$                       (b)  $\text{CH}_3\text{CHO}$                       (c)  $\text{CH}_3\text{COOH}$   
(d)  $\text{CH}_3\text{CH}_2\text{NH}_2$                       (e)  $\text{CH}_3\text{CH}_2\text{CH}_3$
8. Ethylene glycol (1,2-ethanediol) is used extensively as an antifreeze additive in automobile radiators. What properties of ethylene glycol make it a good antifreeze?
- (a) Ethylene glycol coats the radiator to prevent crystallization of ice at low temperatures.  
(b) Ethylene glycol has a higher boiling point than water and is soluble in water.  
(c) Ethylene glycol has a lower freezing point than water and is soluble in water.  
(d) Ethylene glycol forms a film on the surface of the water to prevent ice formation in the radiator.  
(e) Ethylene glycol is insoluble in water.
9. The molecule  $\text{CH}_3\text{COCH}_3$  is classified as:
- (a) an ether                      (b) an ester                      (c) an aldehyde  
(d) a ketone                      (e) a carboxylic acid
10. Esters are formed by reacting the following two species:
- (a) an alkane and an alkene                      (b) an organic acid and an inorganic acid  
(c) an organic acid and an alcohol                      (d) an alcohol and water  
(e) two alcohols
11. What is one possible name for a compound with the general formula  $\text{R—OH}$ ?
- (a) methane                      (b) methyl methanoate                      (c) methanol  
(d) methanoic acid                      (e) methanamine
12. What is the common name of the compound  $\text{CH}_3\text{COOH}$ ?
- (a) acetone                      (b) wood alcohol                      (c) formic acid  
(d) acetic acid                      (e) isopropyl alcohol
13. Identify the compound that is likely to have the highest boiling point.
- (a)  $\text{CH}_4$                       (b)  $\text{CH}_3\text{OH}$                       (c)  $\text{CH}_3\text{CH}_3$   
(d)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$                       (e)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$

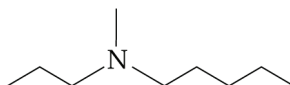
14. Which statement is true of the carbon-carbon bonds in benzene?
- (a) They are identical to the carbon-carbon bonds in cyclohexane.
  - (b) They are identical to the carbon-carbon bonds in cyclohexene.
  - (c) They are half-way between a double and single bond.
  - (d) They are easily broken in chemical reactions.
  - (e) They are all double bonds.
15. Identify the set of compounds that have the same functional group.
- (a)  $C_2H_6$ ,  $C_2H_4$ ,  $C_2H_2$
  - (b)  $C_2H_2$ ,  $CH_3COOH$ ,  $CH_3CONH_2$
  - (c)  $CH_3CH_2CHO$ ,  $H_2CO$ ,  $CH_3CH_2CH_2CH_2CHO$
  - (d)  $CH_3NH_2$ ,  $CH_3CH_2CONH_2$ ,  $CH_3CH_2CONHCH_3$
  - (e)  $CH_3C(O)CH_3$ ,  $CH_3COOH$ ,  $CH_3CH_2CHO$
16. Ethyl methanoate is used as an artificial rum flavouring. What type of compound is ethyl methanoate?
- (a) carboxylic acid      (b) alcohol      (c) ketone      (d) amide      (e) ester
17. What is the IUPAC name for the following compound?
- 
- (a) propyl propanamide      (b) propyl propanoate      (c) N-propylpropanamine  
(d) N, N-propylpropanamide      (e) N-propylpropanamide
18. Which compound is a carboxylic acid?
- (a)  $CH_3CH_2OH$       (b)  $CH_3OCH_3$       (c)  $CH_3COOH$   
(d)  $CH_3COOCH_3$       (e)  $CH_3C(O)CH_3$
19. Which compound is an ether?
- (a)  $CH_3OH$       (b)  $CH_3C(O)CH_3$       (c)  $CH_3COH$   
(d)  $CH_3COOCH_3$       (e)  $CH_3CH_2OCH_3$
20. The name 2-methyl-4-butanal is incorrect. What is the correct IUPAC name for this compound?
- (a) 4-methyl-2-butanal      (b) 3-methylbutanal      (c) 2-methylbutanal  
(d) 2-methyl-1-butanal      (e) 2-methyl-2-butanal

21. What is the IUPAC name of the following ester?



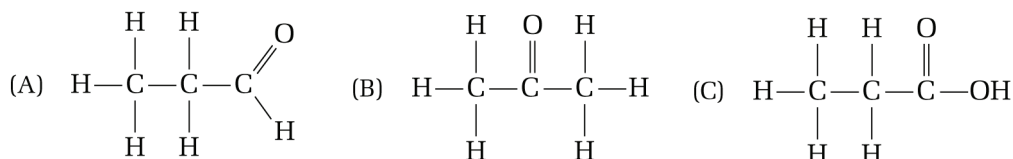
- (a) ethyl methanoate      (b) methyl ethanoate      (c) propyl methanoate  
 (d) methyl propanoate      (e) butyl methanoate

22. What is the IUPAC name of the following amine?



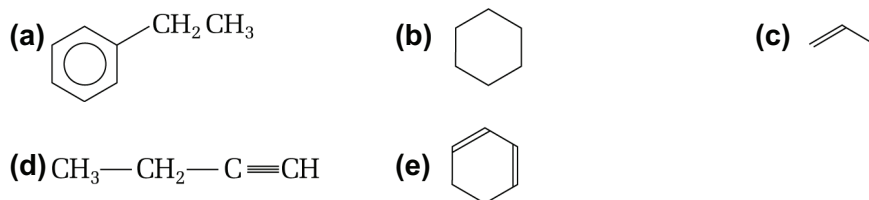
- (a) N-methyl-N-propylpentanamine      (b) N,N-methylpropylpentanamine  
 (c) N-methyl-N-ethylpentanamine      (d) N-methyl-N-propylpropanamine  
 (e) NN-methylethylpropanamine

23. Which structural diagram(s) represent aldehydes?



- (a) A only      (b) B only      (c) C only      (d) A and B      (e) B and C

24. Which of the following molecules is an aromatic hydrocarbon?



25. Which of the following compounds is unable to form hydrogen bonds with itself?

- (a)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$       (b)  $\text{CH}_3\text{CH}_2\text{NH}_2$       (c)  $\text{CH}_3\text{COOH}$   
 (d)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOCH}_2\text{CH}_3$       (e)  $\text{CH}_3\text{CH}_2\text{CONHCH}_3$