

**Project Advance Chemistry 116 Sample Questions  
on Material in *General Chemistry*, Brown, LeMay, and Bursten**

**Chapter 26. Organic Chemistry  
Spring Semester 1995**

- Which of the following could be a cycloalkane?
  - $C_6H_{14}$
  - $C_4H_{10}$
  - $C_5H_{12}$
  - $C_6H_{12}$
  - $C_3H_8$
- Which of the following could be an alkyne?
  - $C_4H_8$
  - $C_2H_4$
  - $C_3H_6$
  - $C_4H_6$
  - $C_2H_6$
- All of the following are structural isomers of  $C_6H_{14}$  except
  - $CH_3(CH_2)_2CH(CH_3)_2$
  - $CH_3(CH_2)_4CH_3$
  - $(CH_3)_2CHCH_2CH_3$
  - $CH_3CH_2C(CH_3)_3$
  - $(CH_3)_2CHCH(CH_3)_2$
- How many structural isomers are possible for hexane?
  - 3
  - 4
  - 5
  - 2
  - 1
- How many structural isomers are possible for heptane?
  - 3
  - 7
  - 5
  - 4
  - 9
- The compound  $(CH_3)_2CHCH(CH_3)CH_2CH(CH_2CH_3)CH_2CH_2CH_3$  is named as a derivative of
  - octane
  - heptane
  - hexane
  - nonane
  - decane

7. The compound  $(\text{CH}_3)_3\text{CCH}_2\text{CH}(\text{CH}_3)_2$  is named as a derivative of
- (a) octane
  - (b) pentane
  - (c) butane
  - (d) hexane
  - (e) heptane
8. The compound  $(\text{CH}_3)_3\text{CCH}_2\text{CH}(\text{CH}_3)_2$  is
- (a) named as a pentane but is an isomer of octane.
  - (b) named as a butane but is an isomer of octane.
  - (c) named as a pentane but is an isomer of heptane.
  - (d) named as a hexane but is an isomer of octane.
  - (e) named as a pentane but is an isomer of hexane.
9. For  $(\text{CH}_3)_2\text{CHCH}(\text{CH}_3)\text{CH}_2\text{CH}(\text{CH}_2\text{CH}_3)\text{CH}_2\text{CH}_2\text{CH}_3$ , the longest unbranched chain of carbon atoms is
- (a) 8
  - (b) 6
  - (c) 7
  - (d) 9
  - (e) 12
10. The name of  $\text{C}(\text{CH}_3)_4$  is
- (a) isopropyl methane
  - (b) 2-methylbutane
  - (c) isobutylmethane
  - (d) 2,2-dimethylpropane
  - (e) pentane
11. The compound 4-ethyl-2-hexene contains
- (a) 7 carbon atoms and 14 hydrogen atoms.
  - (b) 6 carbon atoms and 12 hydrogen atoms.
  - (c) 8 carbon atoms and 18 hydrogen atoms.
  - (d) 6 carbon atoms and 14 hydrogen atoms.
  - (e) 8 carbon atoms and 16 hydrogen atoms.
12. The compound 1-chloro-1-pentene
- (a) has the formula  $\text{C}_5\text{H}_7\text{Cl}$ .
  - (b) has the formula  $\text{C}_5\text{H}_{11}\text{Cl}$ .
  - (c) is an alkane.
  - (d) has 3 structural isomers.
  - (e) exists as *cis* and *trans* isomers.

13. The product of the hydrogenation of *cis*-2-butene is

- (a) 2-butyne
- (b) butane
- (c) *trans*-2-butane
- (d) *cis*-butane
- (e) *trans*-butane

14. The compound 2-methyl-2-pentene

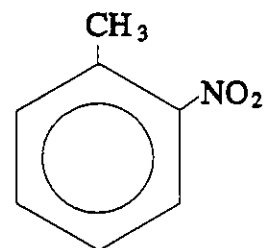
- (a) has 2 structural isomers each of which can be *cis* or *trans*.
- (b) exists as *cis* and *trans* isomers.
- (c) has 3 structural isomers.
- (d) has no structural or geometric isomers.
- (e) has 5 structural isomers.

15. The addition of HBr to 2-butene gives

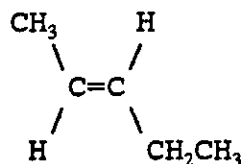
- (a) 2-bromo-1-butene.
- (b) 1-bromobutane.
- (c) 2-bromobutane.
- (d) 2-bromo-2-butene.
- (e) butane.

16. Name the compound shown to the right:

- (a) 2-methyl-3-nitrobenzene
- (b) 1-nitro-2-methylbenzene
- (c) nitrotoluene
- (d) 1-methyl-2-nitrobenzene
- (e) nitrobenzene

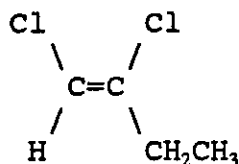


17. Name the following compound



- (a) *trans*-2-pentene
- (b) *cis*-2-pentene
- (c) *trans*-1-ethyl-1-propene
- (d) *trans*-1-methyl-1-butene
- (e) ethylmethylethene

18. Name the following compound



- (a) *cis*-1,2-dichloro-2-ethylethene
  - (b) *trans*-1,2-dichloro-1-butene
  - (c) *cis*-1,2-dichloro-1-butene
  - (d) *cis*-2-ethyl-1,2-dichloroethene
  - (e) dichlorobutene
19. The product of the reaction of *cis*-2-butene with bromine is

- (a) 2,3-dibromobutane
- (b) *cis*-2-bromobutane
- (c) *trans*-2-bromobutane
- (d) *cis*-2,3-dibromobutane
- (e) 2,2-dibromobutane

20. Cyclohexane

- (a) has delocalized electrons.
- (b) is planar.
- (c) undergoes hydrogenation.
- (d) can adopt both a "chair" and a "boat" conformation.
- (e) has the formula  $\text{C}_6\text{H}_{14}$ .

21. Which of the following is an unsaturated hydrocarbon?

- (a) cyclohexane
- (b)  $\text{CH}_3\text{CH}(\text{Cl})\text{CH}_3$
- (c)  $\text{CH}_3\text{CH}(\text{CH}_3)\text{CH}_3$
- (d)  $\text{CH}_3\text{CHCHCH}_2\text{CH}_3$
- (e)  $\text{CH}_3\text{C}(\text{CH}_3)_2\text{CH}_2\text{CH}(\text{CH}_3)_2$

22. The hydroxyl group occurs in

- (a) alcohols, phenols and carboxylic acids.
- (b) aldehydes and ketones.
- (c) carboxylic acids and ketones.
- (d) phenols, aldehydes and ketones.
- (e) alcohols and aldehydes.

23. The carbonyl group occurs in all of the following except
- (a) aldehydes
  - (b) amides
  - (c) carboxylic acids
  - (d) phenols
  - (e) ketones
24. The ester  $\text{CH}_3(\text{CH}_2)_2\text{C}(\text{O})\text{O}(\text{CH}_2)_4\text{CH}_3$  is responsible for the odor of bananas. It can be prepared from
- (a)  $\text{CH}_3(\text{CH}_2)_2\text{CH}_2\text{OH}$  and  $\text{CH}_3(\text{CH}_2)_3\text{CH}_2\text{OH}$
  - (b)  $\text{CH}_3(\text{CH}_2)_2\text{CH}_2\text{OH}$  and  $\text{CH}_3(\text{CH}_2)_3\text{COOH}$
  - (c)  $\text{CH}_3(\text{CH}_2)_2\text{CHO}$  and  $\text{CH}_3(\text{CH}_2)_3\text{CH}_2\text{OH}$
  - (d)  $\text{CH}_3(\text{CH}_2)_2\text{CH}_2\text{OH}$  and  $\text{CH}_3(\text{CH}_2)_3\text{CHO}$
  - (e)  $\text{CH}_3(\text{CH}_2)_2\text{COOH}$  and  $\text{CH}_3(\text{CH}_2)_3\text{CH}_2\text{OH}$
25. When an ester is formed via a condensation reaction with the elimination of water, the oxygen atom in the water molecule comes from
- (a) the aqueous solution.
  - (b) the carbonyl group of the acid.
  - (c) the alcohol.
  - (d) the hydroxyl group of the acid.
  - (e) the aldehyde.