ChemHL OrgChem Name Isomer Ex. G11

* 您的姓名:

* 1. When 50 cm^3 of a hydrocarbon, CxHy, was burned in excess oxygen, 200 cm^3 of carbon dioxide and 250 cm^3 of steam were produced (all volumes were measured under the same conditions). What is the molecular formula of the hydrocarbon?

- A. C2H4
- B. C3H8
- C. C4H8
- D. C4H10

* 2. Which steps are involved in the free-radical mechanism of the bromination of ethane in the presence of ultraviolet radiation?

I. $C_2H_6 + Br\bullet \rightarrow C_2H_5\bullet + HBr$

II. $C_2H_5\bullet + Br_2 \rightarrow C_2H_5Br + Br\bullet$

III. $C_2H_5\bullet + Br\bullet \rightarrow C_2H_5Br$

- A. I and II only
- B. I and III only
- C. II and III only

D. I, II and III

* 3. What is the difference between the strength and the length of the carbon-oxygen bond in butanal and in butan-1-ol?

A. The bond in butanal is stronger and longer than in butan-1-ol.

B. The bond in butanal is weaker and shorter than in butan-1-ol.

C. The bond in butanal is weaker and longer than in butan-1-ol.

D. The bond in butanal is stronger and shorter than in butan-1-ol.

* 4. What is the IUPAC name for $HCOOCH_2CH_2CH_3$?

A. Butanoic acid

B. Butanal

C. Methyl propanoate

D. Propyl methanoate

* 5. Identify the class name that $HCOCH_2CH_3$ is in.

A. Ester

B. Ketone

C. Aldehyde

D. Alcohol

* 6. Which three compounds can be considered to be a homologous series?

A. CH3OH, CH3CH2OH, CH3CH2CH2OH

B. CH3CH2OH, CH3CHO, CH3COOH

C. CH3CH2CH(OH)CH3, CH3CH2CH2CH2OH, (CH3)3COH

D. CH3CH2CH2CH2OH, CH3CH2OCH2CH3, (CH3)2CH2CHO

* 7. Which is the best definition of structural isomers?

- A. Compounds which have atoms with the same atomic numbers but different mass numbers
- B. Compounds which have the same general formula but differ by a CH2 group
- C. Compounds which have the same empirical formula but different molecular formulas
- D. Compounds which have the same molecular formula but different arrangements of atoms

* 8. Which substances are possible products of the incomplete combustion of octane?

- A. Carbon dioxide and hydrogen gas
- B. Carbon monoxide and water vapour
- C. Carbon monoxide and hydrogen gas
- D. Methane and hydrogen gas

* 9. What is the IUPAC name of $CH_3CH_2CONH_2$?

- A. Aminopropanal
- B. Ethanamide
- C. Propylamine
- D. Propanamide

* 10. How many isomers can exist for a compound with the molecular formula C2H2Cl2?

- A. 1
- B. 2
- C. 3

D. 4

* 11. Which statement is correct about the reaction between methane and chlorine?

A. It involves heterolytic fission and Cl^- ions.

B. It involves heterolytic fission and $Cl\cdot$ radicals.

C. It involves homolytic fission and Cl^- ions.

D. It involves homolytic fission and $Cl\cdot$ radicals.

* 12. Which compound is a member of the same homologous series as $CH_3CH_2CHCClCH_3$?

A. 1-chloropropene

B. 1-chlorobutane

C. 1-bromopropane

D. 1,1-dichloropropane

* 13. Which of the following is a secondary alcohol?

A. 3-methylbutan-1-ol

B. 2-methylbutan-2-ol

C. 2,3-dimethylbutan-2-ol

D. butan-2-ol

* 14. Which of the following description is incorrect for the compound $HCOOCH_2CHClCH_2CH(OH)CH_2NHCH_3$?

A. The IHD of this compound is 1.

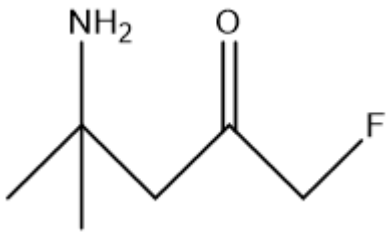
B. This compound has a secondary hydroxyl group.

C. This compound has a secondary chlorine atom.

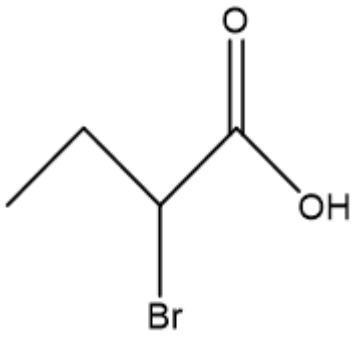
D. This compound has a primary amino group.

* 15. State the IUPAC names for the following compounds.

(a)



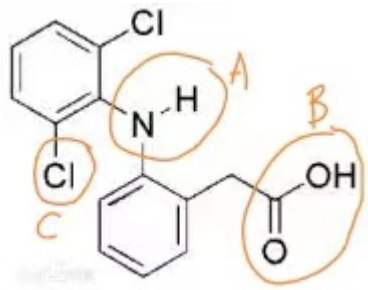
(b)

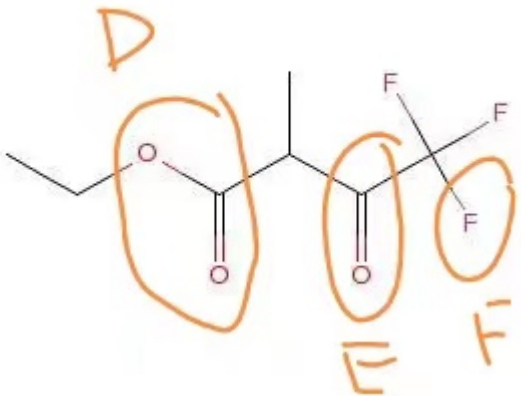


(c) (CH3)3CCHClCH2OH

(d) CH3(CH2)4COOCH2CH3

* 16. Identify the functional groups indicated in the following compound.





A:

B:

C:

D:

E:

F:

* 17. There are ____ structural isomers of C_8H_{18}, in which ____ isomers have 7 carbon atoms as their main carbon chains, ____ isomers have 6, ____ isomers have 5 (there are also other isomers that have more than 7 or less than 5 carbon atoms as their main carbon chains).

* 18. An organic compound X containing only carbon, hydrogen and oxygen was analyzed gravimetrically. When completely combusted in air, 1.442g of the compound X produced 3.521g of carbon dioxide and 1.441g of water. The molar mass of compound X is 72.1 g mol-1. (The relative atomic mass of C: 12.01, H: 1.01, O: 16.00)

(a) Determine empirical formula of the organic compound. ____

(b) Determine molecular formula of the organic compound. ____

(c) Name three isomers that possess carbonyl group of this compound X.

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* 19. Balance the following equations.

____ C_8H_{18} + ____ O_2 —> ____ C + ____ H_2O

____ C_6H_{12} + ____ O_2 —> ____ CO + ____ H_2O

____ $C_{12}H_{22}O_{11}$ + ____ O_2 —> ____ CO_2 + ____ H_2O

* 20. Write the four chemical equations that show the propagation stage of the reaction between ethane and iodine under UV light to show the formation of iodoethane and diiodoethane, clearly show the unpaired electrons in any free radicals.

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