Hydrocarbons (1216508)

Question 12345678910111213141516171819

Instructions
Do not leave spaces when naming organic molecules. Example: 2,3-dimethylheptane or 4-ethyl-2-fluoroheptane

1. Which statement best describes the relationship between the following two structures?
   (a) They are identical.
   (b) They have different molecular formulas.
   (c) They are isomers.
   (d) They are conformers.
   (e) One is an alkene and the other is an alkyne.

2. The structure of linoleic acid, found in plants and animals, is shown below.

   Are the double bonds cis or trans?
   - cis
   - trans

   How can you tell?
   - The groups in the longest chain are on the same side of the double bond.
   - The groups in the longest chain are on opposite sides of the double bond.

   Would this compound be classified as a trans fat or is it the natural cis form of the fatty acid?
   - The molecule shown is the (semi)synthetic trans version of the fatty acid.
   - The molecule shown is the natural cis version of the fatty acid.

3. How many carbon atoms are there in the cycloalkane shown below?

   How many hydrogen atoms are there on each carbon atom?

   How is the number of hydrogen atoms in this cycloalkane different from the straight-chain hydrocarbon with the same number of carbon atoms?
   - There are 2 more hydrogen atoms in the straight-chain hydrocarbon than in the cycloalkane with the same number of carbon atoms.

4. Select two different conformations of C5H12.
   - cis
   - trans
   - The molecule shown is the (semi)synthetic trans version of the fatty acid.
   - The molecule shown is the natural cis version of the fatty acid.
5. Question Details GBEssG0B1 6.TB.097. [1219718]

Cholesterol can't be transported through the bloodstream without the aid of lipoproteins because:

- (a) It is too large.
- (b) It is too small.
- (c) It is hydrophobic.
- (d) It is hydrophilic.
- (e) Actually, cholesterol can be transported through the bloodstream without the aid of lipoproteins.

6. Question Details GBEssG0B1 6.AE.060. [1219735]

What is the geometry of a carbon atom in the double bond of an alkene: tetrahedral, trigonal planar, or linear?

- [ ] tetrahedral
- [ ] trigonal planar
- [ ] linear

7. Question Details GBEssG0B1 6.AE.077. [1219702]

Write the geometric isomer of the compound shown below:
8. Which of these molecules has the highest melting point?

(a) A
(b) B
(c) C
(d) D
(e) E

9. Which of the following statements describes why "good fats" are considered good and "bad fats" are considered bad?
   I. A diet high in saturated fat can result in heart disease.
   II. A diet high in unsaturated fat can result in type 2 diabetes.
   III. A diet high in trans fats can result in a decreased risk of cancer.
   IV. A diet high in unsaturated fats can result in a decreased risk of cancer.
   (a) All of these statements are true.
   (b) I and II are true.
   (c) I, III, and IV are true
   (d) I and IV are true.
   (e) II and III are true.

10. Provide skeletal line structures for the following condensed formulas.

(a) \[
\begin{align*}
\text{CH}_3 \\
\text{CH}_3\text{CH}_2\text{CHCHCH}_3 \hspace{1cm} \text{CH}_2\text{CH}_3
\end{align*}
\]
11. Question DetailsGBEssGOB1 6.TB.042. [1219727]
How many hydrogens are bonded to the carbons with the arrows pointing to them?

(a) carbon 1: 0 carbon 2: 0
(b) carbon 1: 0 carbon 2: 2
(c) carbon 1: 1 carbon 2: 2
(d) carbon 1: 4 carbon 2: 4
(e) It is not possible to tell given the skeletal line structure.

12. Question DetailsGBEssGOB1 6.TB.006. [1219683]
Which of these fatty acids is considered a "good fat"?
13. Question Details
Which of the following is NOT a function of cholesterol in the body?
(a) Cholesterol is a component of cell membranes.
(b) Cholesterol is used by the body to make bile.
(c) Cholesterol is used by the body to make steroid hormones.
(d) Cholesterol is used to repair clogged arteries.
(e) Cholesterol is the body's raw material for making vitamin D.

14. Question Details
Name the following branched-chain alkanes:
(a) 4-ethyl-5-methyl-6-propylnonane
(b) 3,4-diethylheptane
15. **Question Details**

Provide skeletal line structures for the following alkenes:

(a) 2,3,4-trimethyl-2-hexene

(b) ethene

(c) propene

(d) 2-methyl-2-butene
Provide skeletal line structures for the IUPAC names below:
(a) 2,2-dimethyl-3-ethylhexane

(b) cis-4-ethyl-2-hexene

Which of the following is NOT often recommended for reducing the level of LDLs and increasing the level of HDLs in the blood?

(a) Reducing the amount of cholesterol in the diet.
(b) Reducing the amount of unsaturated fats in the diet.
(c) Reducing the amount of saturated fats in the diet.
(d) Taking cholesterol-reducing drugs.
(e) Increasing activity.

Which molecule is commonly called toluene?
19. Write the structural formula of the two structural isomers of C₄H₁₀. Label the branched-chain and straight-chain structural isomer.

(a) benzene
(b) methylbenzene
(c) ethylbenzene
(d) propylbenzene
(e) butylbenzene