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Chapter 11 (397936)

About this Assignment

Description

Carbon: More than Just Another Element

Instructions

Carbon: More than Just Another Element

1. KT6 11.P.002. [467389] [Show Details](#)

What is the molecular formula for an alkane with 11 carbon atoms? (Type your answer using the format C₂H₄ for C₂H₄.)

2. KT6 11.P.008. [489800] [Show Details](#)

Select structures for 3-ethylpentane and 2,3-dimethyl pentane.

3-ethylpentane

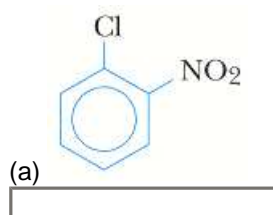
- $$\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}-\text{CH}_3 \\ | \\ \text{CH}_2 \end{array}$$
- $$\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{CH}_2-\text{CH}-\text{CH}_2-\text{CH}_3 \\ | \\ \text{CH}_2 \end{array}$$
- $$\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3-\text{CH}-\text{CH}_2-\text{CH}_3 \\ | \\ \text{CH}_2 \end{array}$$
- $$\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{CH}_2-\text{CH}-\text{CH}_2-\text{CH}_3 \end{array}$$

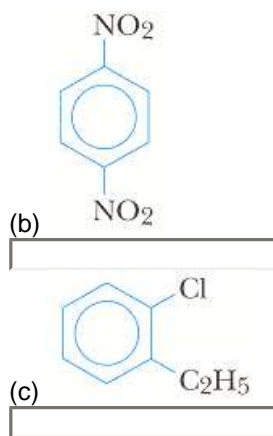
2,3-dimethyl pentane

- $$\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{CH}_2-\text{CH}-\text{CH}_2-\text{CH}_3 \\ | \\ \text{CH}_2 \end{array}$$
- $$\begin{array}{c} \text{CH}_3 \quad \text{CH}_3 \\ | \quad | \\ \text{H}_3\text{C}-\text{CH}-\text{CH}-\text{CH}_2-\text{CH}_3 \end{array}$$
- $$\begin{array}{c} \text{CH}_3 \quad \text{CH}_3 \\ | \quad | \\ \text{H}_3\text{C}-\text{CH}-\text{CH}-\text{CH}_3 \end{array}$$
- $$\begin{array}{c} \text{CH}_3 \quad \text{CH}_3 \\ | \quad | \\ \text{H}_3\text{C}-\text{CH}-\text{CH}-\text{CH}_2-\text{CH}_2-\text{CH}_3 \end{array}$$

3. KT6 11.P.026. [467451] [Show Details](#)

Give the systematic name for each of the following compounds.



4. KT6 11.P.032. [489791] [Show Details](#)

Select structural formulas for the following alcohols, and tell if each is primary, secondary or tertiary.

(a) 1-butanol

- $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$ secondary
 $\text{HO}-\text{CH}_2\text{CH}_2\text{CH}_3$ primary
 $\text{HO}-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ tertiary
 $\text{HO}-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$

(b) 2-butanol

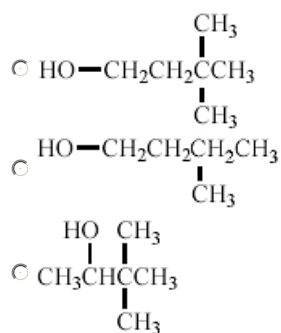
- $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$ primary
 $\begin{array}{c} \text{OH} \\ | \\ \text{CH}_3\text{CHCH}_2\text{CH}_3 \end{array}$ secondary
 $\begin{array}{c} \text{OH} \\ | \\ \text{CH}_3\text{CHCH}_3 \end{array}$ tertiary
 $\begin{array}{c} \text{OH} \\ | \\ \text{CH}_3\text{CHCH}_2\text{CH}_2\text{CH}_3 \end{array}$

(c) 3,3-dimethyl-2-butanol

- $\begin{array}{c} \text{HO} \quad \text{CH}_3 \\ | \quad | \\ \text{CH}_3\text{CHCCH}_3 \\ | \\ \text{CH}_3 \end{array}$ primary
 $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 \\ | \\ \text{CH}_2 \\ | \\ \text{CH}_3\text{CHCCH}_3 \\ | \\ \text{CH}_3 \end{array}$ secondary
 $\begin{array}{c} \text{HO} \\ | \\ \text{CH}_3\text{CH}_2\text{CH}_3 \end{array}$ tertiary
 $\text{HO}-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$

(d) 3,3-dimethyl-1-butanol

- $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_2\text{CH}_2\text{CCH}_3 \\ | \\ \text{CH}_3 \end{array}$ primary
 secondary
 tertiary



5. KT6 11.P.034. [467369] [Show Details](#)

Name the following amines.

- (a) $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$
- aminopropane
 - 2-propylamine
 - 2-aminopropane
 - propylamine
- (b) $(\text{CH}_3)_3\text{N}$
- triaminomethane
 - trimethylamine
 - 1,3-aminomethane
 - 3-methylamine
- (c) $(\text{CH}_3)(\text{C}_2\text{H}_5)\text{NH}$
- 1,2-ethylmethylamine
 - aminomethylethane
 - 1,2-methylethylamine
 - ethylmethylamine

6. KT6 11.P.038. [489803] [Show Details](#)

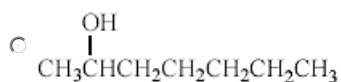
Aldehydes and carboxylic acids are formed by oxidation of primary alcohols, and ketones are formed when secondary alcohols are oxidized. Give the name and formula for the alcohol that, when oxidized gives the following products.

(a) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$

- | | |
|---|----------------------------------|
| <input type="radio"/> $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2-\text{OH}$ | <input type="radio"/> 1-pentanol |
| <input type="radio"/> $\begin{array}{c} \text{OH} \\ \\ \text{CH}_3\text{CHCH}_2\text{CH}_2\text{CH}_3 \end{array}$ | <input type="radio"/> 2-butanol |
| <input type="radio"/> $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2-\text{OH}$ | <input type="radio"/> 2-pentanol |
| <input type="radio"/> $\begin{array}{c} \text{OH} \\ \\ \text{CH}_3\text{CHCH}_2\text{CH}_3 \end{array}$ | <input type="radio"/> 1-butanol |

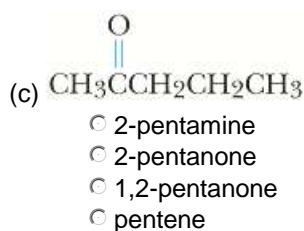
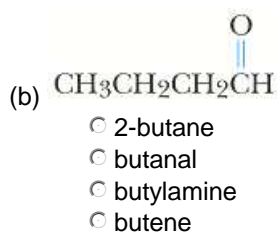
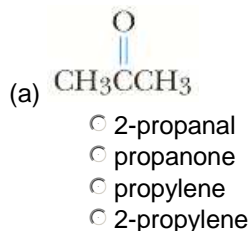
(b) 2-hexanone

- | | |
|--|----------------------------------|
| <input type="radio"/> $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2-\text{OH}$ | <input type="radio"/> 2-hexanol |
| <input type="radio"/> $\begin{array}{c} \text{OH} \\ \\ \text{CH}_3\text{CHCH}_2\text{CH}_2\text{CH}_2\text{CH}_3 \end{array}$ | <input type="radio"/> 1-heptanol |
| <input type="radio"/> $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2-\text{OH}$ | <input type="radio"/> 1-hexanol |
| | <input type="radio"/> 2-heptanol |



7. KT6 11.P.040. [467450] [Show Details](#)

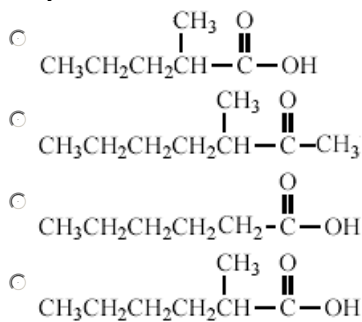
Identify the systematic names for each of the following compounds.



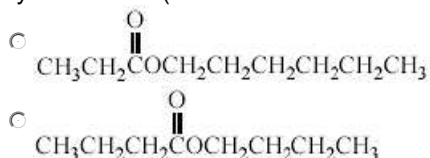
8. KT6 11.P.042. [489798] [Show Details](#)

Select structural formulas for the following acids and esters.

(a) 2-methylhexanoic acid



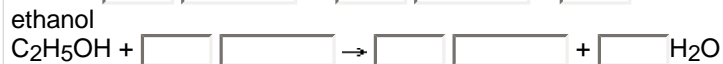
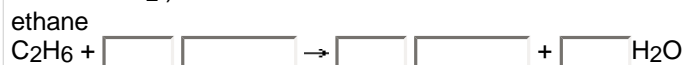
(b) pentyl butanoate (which has the odor of apricots)



- $\text{CH}_3\text{CH}_2\text{CH}_2\overset{\text{O}}{\parallel}\text{COCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$
- $\text{CH}_3\text{CH}_2\text{CH}_2\overset{\text{O}}{\parallel}\text{COCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$
- (c) octyl acetate (which has the odor of oranges)
- $\text{CH}_3\overset{\text{O}}{\parallel}\text{COCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$
- $\text{CH}_3\overset{\text{O}}{\parallel}\text{COCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$
- $\text{CH}_3\text{CH}_2\overset{\text{O}}{\parallel}\text{COCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$
- $\text{CH}_3\text{CH}_2\overset{\text{O}}{\parallel}\text{COCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$

9. KT6 11.P.095. [467344] [Show Details](#)

Write balanced equations for the combustion of ethane and ethanol. (Type your answer using the format CO2 for CO₂.)



(a) Calculate the heat of combustion for each compound.

ethane
 $\boxed{}$ kJ/g

ethanol
 $\boxed{}$ kJ/g

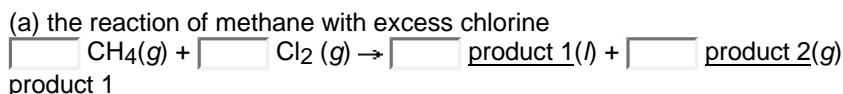
Which has the more negative enthalpy change for combustion per gram?

- ethane
- ethanol

(b) If ethanol is assumed to be partially oxidized ethane, what effect does this have on the heat of combustion?

10. KT6 11.P.014. [489789] [Show Details](#)

Give balanced equations for the following reactions of alkanes. (Use the lowest possible coefficients.)



- CCl₄
- CCl₂
- CH₂
- CH₃

product 2

- CH₃
- Cl⁻
- HCl
- H⁺

(b) complete combustion of cyclohexane, C₆H₁₂, with excess oxygen



product 1

- CO₂
- C₆H₁₁⁻
- CO
- C₂H₄

product 2

- H₃O⁺
- H⁺
- H₂O
- HO⁻

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