

Get some extra practice worksheets to accompany
Chemistry for the Biosciences, fourth edition

Chapter 7 Functional groups: adding function to the framework of life

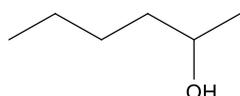
Chapter 9 Isomerism: generating chemical variety

Get some extra practice...

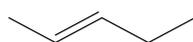
...using nomenclature to denote the location of substituent groups

1. What are the names of the following compounds?

a.



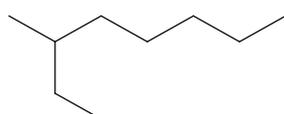
b.



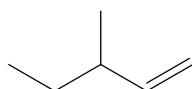
c.



d.



e.



2. Draw the simplified structural formulae of the following:

a. Pentan-3-ol

b. Hex-3-ene

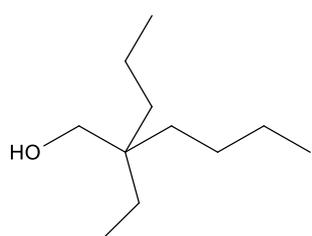
c. But-2-yne

Get some extra practice worksheets to accompany
Chemistry for the Biosciences, fourth edition

Chapter 7 Functional groups: adding function to the framework of life

Chapter 9 Isomerism: generating chemical variety

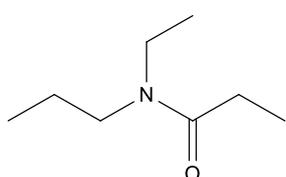
- d. 2-methylbutane
- e. 2-ethyl pentanoic acid
3. Draw the simplified structural formulae of the following:
- a. 2,2,5-trimethylhexane
- b. Pentane 2,4-diol
- c. Octa-1,4-diene
- d. 4-methylhexan-2-ol
- e. 2-methylhexa-1,5-diene
4. What are the names of the following compounds?
- a.



b.



c.

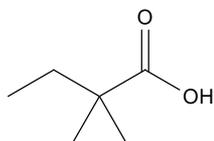


Get some extra practice worksheets to accompany
Chemistry for the Biosciences, fourth edition

Chapter 7 Functional groups: adding function to the framework of life

Chapter 9 Isomerism: generating chemical variety

d.



Scroll to the following pages to check your answers.

Get some extra practice worksheets to accompany
Chemistry for the Biosciences, fourth edition

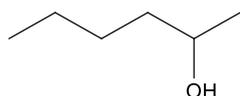
Chapter 7 Functional groups: adding function to the framework of life

Chapter 9 Isomerism: generating chemical variety

Answers

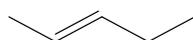
1. What are the names of the following compounds?

a.



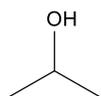
Hexan-2-ol

b.



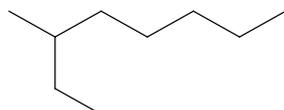
Pent-2-ene

c.



Propan-2-ol

d.



3-methyloctane

Remember: always look out for the longest carbon chain as the basis of your molecule name. If you look carefully, the longest continuous chain here is eight carbons long, with a methyl group at carbon 3. At first sight, though, it is tempting to think this is seven-carbon chain with an ethyl group at carbon 2 – but this would fail to recognise that there is an unbroken chain of eight carbons here.

e.



3-methylpent-1-ene

Remember: always indicate the position of the double bond using the lowest possible number. At first sight, the double bond may look like it starts at the fourth carbon – but

Get some extra practice worksheets to accompany
Chemistry for the Biosciences, fourth edition

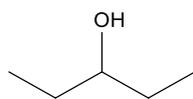
Chapter 7 Functional groups: adding function to the framework of life

Chapter 9 Isomerism: generating chemical variety

this is only true if you're numbering from left to right. If you look from the other direction, you'll see that the double bond starts at the first carbon, so that's the numbering we use (hence pent-1-ene, not pent-4-ene).

2. Draw the simplified structural formulae of the following:

a. Pentan-3-ol



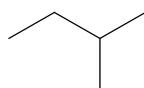
b. Hex-3-ene



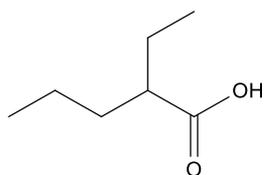
c. But-2-yne



d. 2-methylbutane

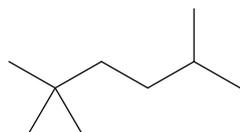


e. 2-ethyl pentanoic acid

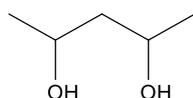


3. Draw the simplified structural formulae of the following:

a. 2,2,5-trimethylhexane



b. Pentane 2,4-diol



c. Octa-1,4-diene

Get some extra practice worksheets to accompany
Chemistry for the Biosciences, fourth edition

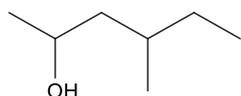
Chapter 7 Functional groups: adding function to the framework of life

Chapter 9 Isomerism: generating chemical variety

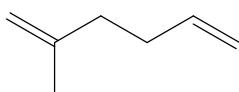


Remember: 'diene' tells us there are two double bonds ('di' = two).

d. 4-methylhexan-2-ol

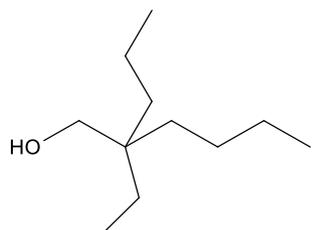


e. 2-methylhexa-1,5-diene



4. What are the names of the following compounds?

a.



2-ethyl-2-propylhexan-1-ol

In this case, the longest unbroken chain is eight carbons long – but the functional group isn't directly attached to that chain, so it can't be the basis of our compound for naming purposes. Instead, the longest chain to which the –OH group is directly attached is six carbons long. So, this is an alcohol (hexan-1-ol) with two alkyl groups attached, both at the second carbon: one ethyl group, and one propyl group.

b.



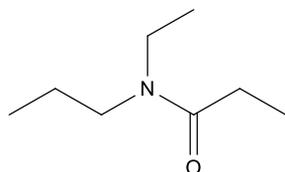
4,4-dimethylhept-2-ene

Get some extra practice worksheets to accompany
Chemistry for the Biosciences, fourth edition

Chapter 7 Functional groups: adding function to the framework of life

Chapter 9 Isomerism: generating chemical variety

c.

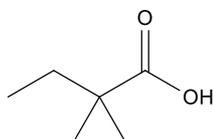


N-ethyl N-propylpropanamide

The first step in naming this compound is to figure out what the base compound is. If we look carefully, we see that we're looking at an amide, with the CON(H₂) functional group – though, in this case, it's a tertiary amide in which both Hs have been substituted with alkyl groups.

The base amide (the carbon chain to which the nitrogen and =O are attached) has three carbons, giving us propanamide as the basic name. The rest of the name tells us about the alkyl groups attached to the N: one ethyl and one propyl group. The *N* tells us that the alkyl group is attached to the nitrogen.

d.



2,2-dimethylbutanoic acid

As with other questions, look out for the longest carbon chain to establish the base compound here – in this case, the four-carbon butanoic acid.