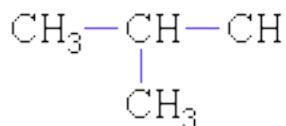


CH 222 Chapter Twenty Concept Guide

1. Organic Nomenclature

Question

Is the following compound an alkane, alkene, or alkyne; saturated or unsaturated; branched or straight chain?



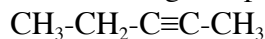
Solution:

It is a branched-chain, saturated alkane. All organic compounds with all C-C single bonds are saturated. Compounds with only C-C single bonds are alkanes.

2. Organic Nomenclature

Question

Is the following compound an alkane, alkene, or alkyne; saturated or unsaturated; branched or straight chain?



Solution:

This is 2-butyne. It is a straight chain, unsaturated alkyne. All organic compounds with double or triple C-C bonds are unsaturated. Compounds with C-C triple bonds are alkynes.

3. Reactions of Organic Compounds

Problem

Predict the product of the hydrogenation reaction of 1-butene and $\text{H}_2(\text{g})$: $\text{CH}_2 = \text{CHCH}_2\text{CH}_3 + \text{H}_2$

Approach

This is a hydrogenation reaction, thus H atoms will add across the C-C double bond forming an alkane.

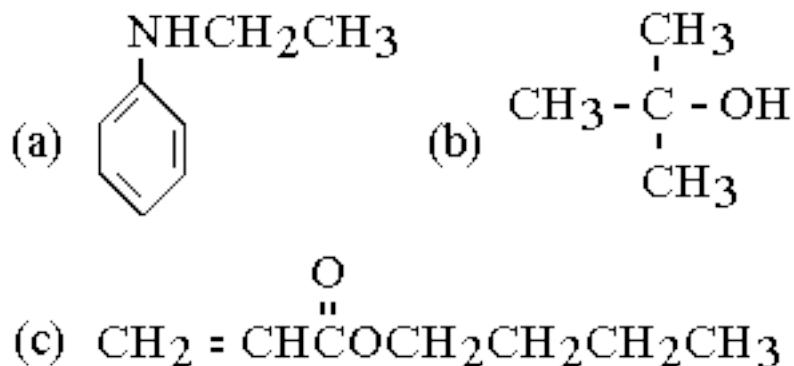
Solution:

The product is butane: $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$

4. Classification of Organic Compounds

Problem

Classify the following compounds according to the types of compounds listed below.



Types of Organic Compounds

Alcohol Aldehyde Amine Carboxylic Acid
Ester Ketone Phenol

Approach

Identify the functional groups and the hydrocarbon portions in each molecule.

Solution

(a). An amine (secondary). The hydrocarbon is C_6H_5 and C_2H_5 .

(b). An alcohol. The hydrocarbon is C_4H_9 .

(c). An ester. The hydrocarbon is $\text{CH}_2=\text{CH}$ and $\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$.

5. Synthesizing Carboxylic Acids

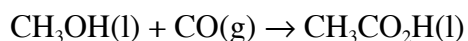
Problem

The reaction of methanol and carbon monoxide yields a carboxylic acid that is produced in bread when leavened by a particular yeast, *Saccharomyces exigus*. Predict this product.

Approach

Write out the reaction of methanol and carbon monoxide. Balance the equation.

Solution



The product is acetic acid.