

Chapter 20

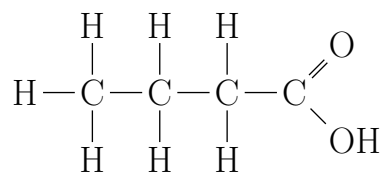
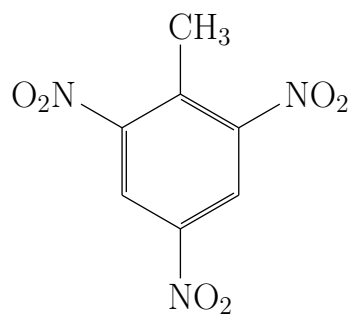
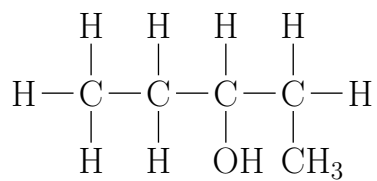
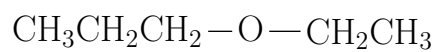
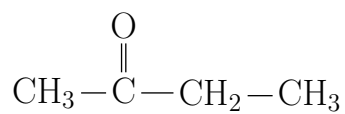
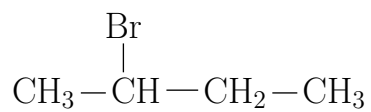
Organic Functional Groups

May 11, 2019

Overhead 20 # 1 Organic Functional Groups

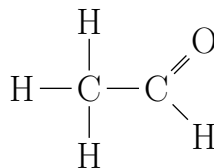
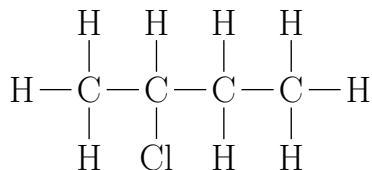
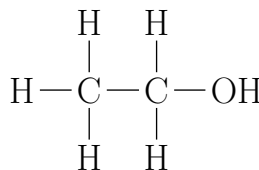
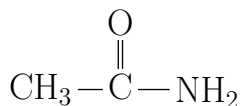
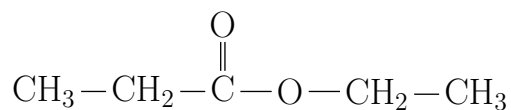
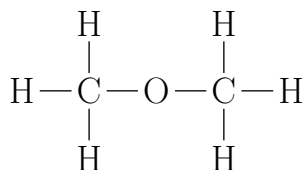
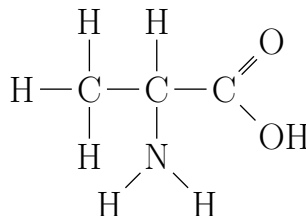
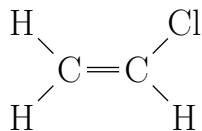
- A functional group is a specific arrangement of atoms in an organic compound that is capable of characteristic chemical reactions.

Table R: Organic Functional Groups			
Class of Compound	Functional Group	General Formula	Example
alcohol	$-\text{OH}$	$\text{R}-\text{OH}$	$\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ 1-propanol
aldehyde	$\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{H} \end{array}$	$\begin{array}{c} \text{O} \\ \parallel \\ \text{R}-\text{C}-\text{H} \end{array}$	$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3\text{CH}_2-\text{C}-\text{H} \end{array}$ propanal
amide	$\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{N}-\text{H} \end{array}$	$\begin{array}{c} \text{O} \quad \text{R}' \\ \parallel \quad \\ -\text{C}-\text{N}-\text{H} \end{array}$	$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3\text{CH}_2-\text{C}-\text{NH}_2 \end{array}$ propanamide
amine	$\begin{array}{c} \\ -\text{N}- \end{array}$	$\begin{array}{c} \text{R}' \\ \\ \text{R}-\text{N}-\text{R}'' \end{array}$	$\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$ 1-propanamine
ether	$-\text{O}-$	$\text{R}-\text{O}-\text{R}'$	$\text{CH}_3\text{OCH}_2\text{CH}_3$ methyl ethyl ether
ester	$\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{O}- \end{array}$	$\begin{array}{c} \text{O} \\ \parallel \\ \text{R}-\text{C}-\text{O}-\text{R}' \end{array}$	$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3\text{CH}_2-\text{C}-\text{O}-\text{CH}_3 \end{array}$ methyl propanoate
halide (halocarbon)	$-\text{F}$ (fluoro-) $-\text{Cl}$ (chloro-) $-\text{Br}$ (bromo-) $-\text{I}$ (iodo-)	$\text{R}-\text{X}$ (X represents any halogen)	$\text{CH}_3\text{CHClCH}_3$ 2-chloropropane
ketone	$\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}- \end{array}$	$\begin{array}{c} \text{O} \\ \parallel \\ \text{R}-\text{C}-\text{R}' \end{array}$	$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3-\text{C}-\text{CH}_2\text{CH}_2\text{CH}_3 \end{array}$ 2-pentanone
organic acid	$\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{OH} \end{array}$	$\begin{array}{c} \text{O} \\ \parallel \\ \text{R}-\text{C}-\text{OH} \end{array}$	$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3\text{CH}_2-\text{C}-\text{OH} \end{array}$ 2-propanoic acid



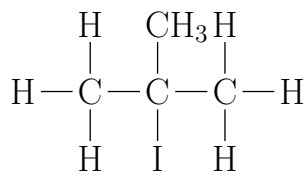
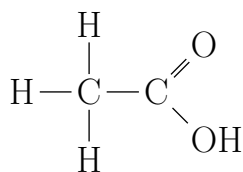
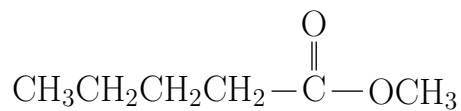
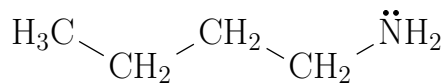
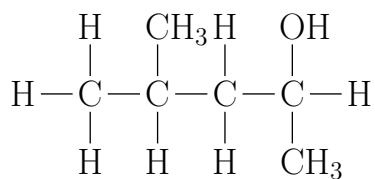
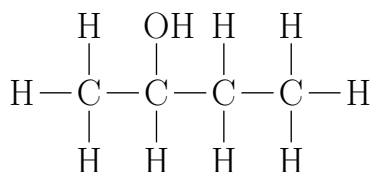
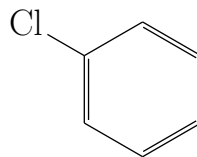
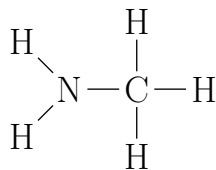
Overhead 20 # 1 Organic Functional Groups, con't

Name the following organic compounds.



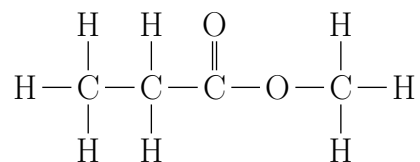
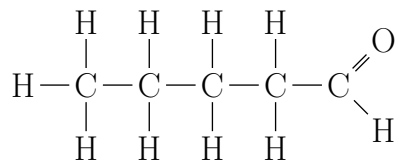
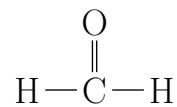
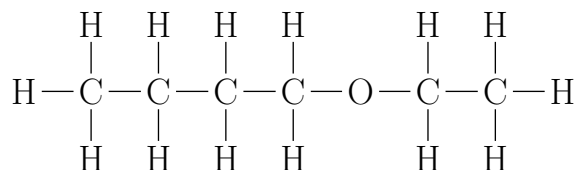
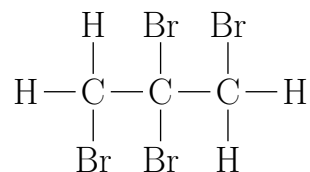
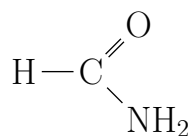
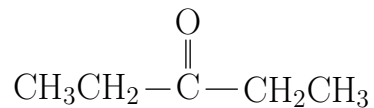
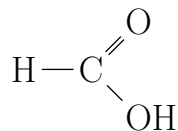
Overhead 20 # 1 Organic Functional Groups, con't

Name the following organic compounds.



Overhead 20 # 1 Organic Functional Groups, con't

Name the following organic compounds.



Overhead 20 # 1 Organic Functional Groups, con't

Draw structural formulas of the following organic compounds.

4-iodo-2-hexene

pentanamine

hexanoic acid

ethyl methanoate

2-methyl-2-propanol

pentanamide

pentyl methyl ether

diethyl ether

3-hexanone

Overhead 20 # 2 Isomers

- Structural isomers have the same functional group in a different position.

Draw the structural formula of the following compounds then its structural isomer.

2-butanol

Isomer

3-pentanone

Isomer

- Functional isomers have the same chemical formula but different functional groups.

Draw the structural formula of the following compounds then its functional isomer.

methyl ethyl ether

Isomer

propanal

Isomer