

Naming organic compounds with functional groups

Lesson 1a

[Click](#) to refresh yourself with naming of organic compounds.

[Click](#) to revise naming alcohols

When the functional groups are:

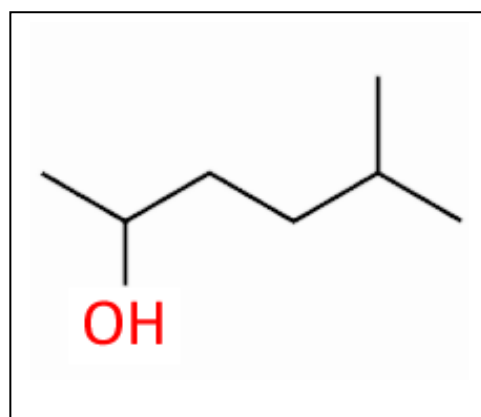
- COOH (Carboxyl group, the molecule has a carboxylic acid backbone)
- OH (Hydroxyl group, the molecule is known as an alcohol)
- NH₂ (Amine group the molecule is known as an amine)
- C=C (Carbon to carbon double bond, the molecule is an alkene)

When the above functional groups are present the molecule is named accordingly and takes the name of the longest carbon chain that contains that functional group.

For example consider the molecule on the right. It has a hydroxyl group. The backbone, therefore, must be an alcohol and the carbons are numbered so as to make the carbon with the hydroxyl group attached the lowest numbered carbon possible.

The backbone is **hexan-2-ol**

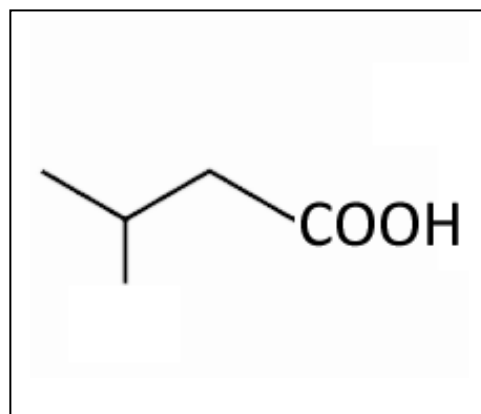
Since there is a methyl group coming off carbon number five we name the molecule **5-methylhexan-2-ol**



The molecule on the right has a carboxyl group. The backbone, therefore, must be a carboxylic acid and the carbon on the carboxyl group is always numbered one.

The backbone is **butanoic acid**

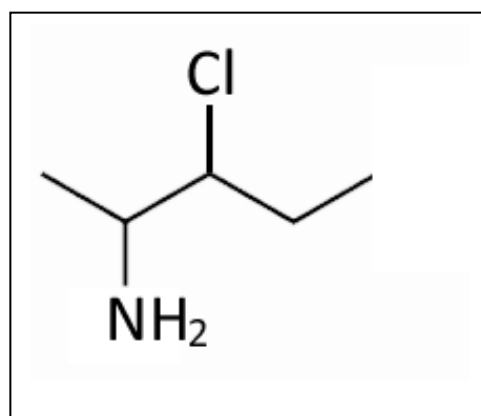
Since there is a methyl group coming off carbon number three we name the molecule **3-methylbutanoic acid**



The molecule on the right has an amine group. The backbone, therefore, must be an amine and the carbon that the amine functional group is attached is numbered so it is the lowest numbered carbon..

The backbone is **butan-2-amine**

Since there is a chlorine coming off carbon number three we name the molecule **3-chlorobutan-2-amine**

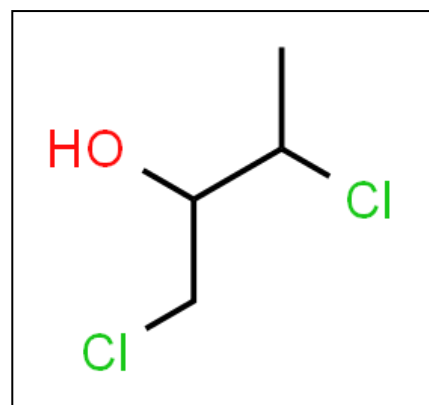


- 1) Name the following molecules and write the semi-structural formulae of the following molecules.

[Click](#) to refresh semi-structural formula

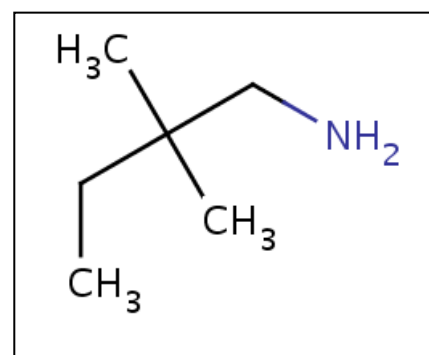
1,3-dichlorobutan-2-ol

$\text{CH}_2\text{ClCHOHCHClCH}_3$



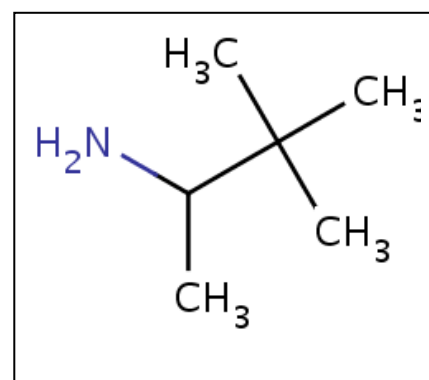
2,2-dimethylbutan-1-amine

$\text{CH}_3\text{CH}_2\text{C}(\text{CH}_3)_2\text{CH}_2\text{NH}_2$



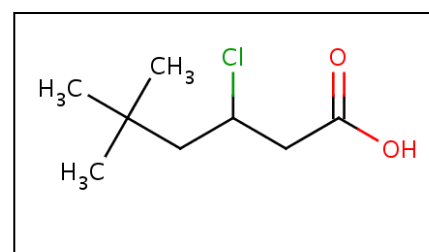
3,3-dimethylbutan-2-amine

$\text{CH}_3\text{CH}(\text{NH}_2)\text{C}(\text{CH}_3)_3$



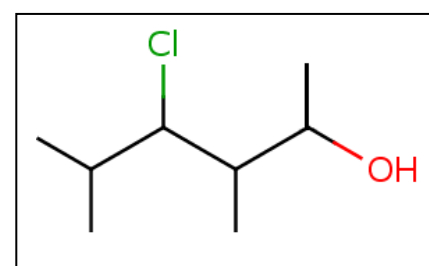
3-chloro-5,5-dimethylhexanoic acid

$\text{CH}_3\text{C}(\text{CH}_3)_2\text{CH}_2\text{CHClCH}_2\text{COOH}$

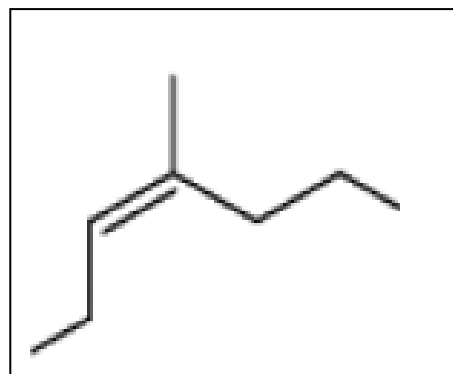


4-chloro-3,5-methylhexan-2-ol

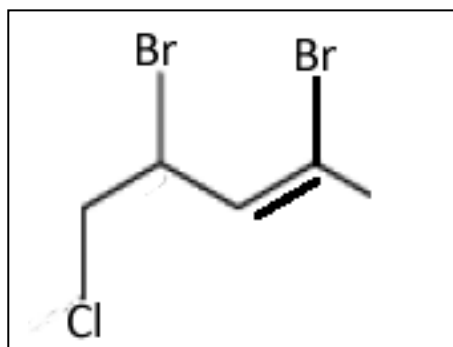
$(\text{CH}_3)_2\text{CHCHClCH}(\text{CH}_3)\text{CH}(\text{OH})\text{CH}_3$



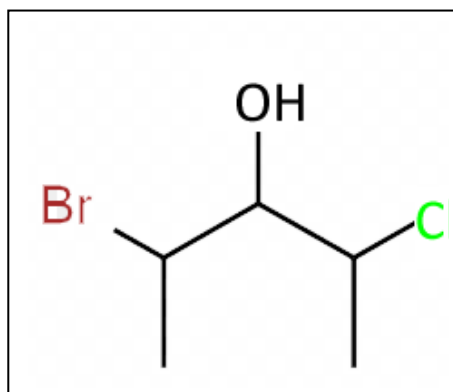
4-methylhept-3-ene



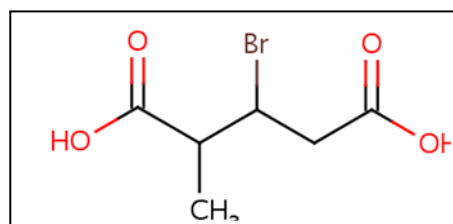
2,4-dibromo-5-chloropent-2-ene



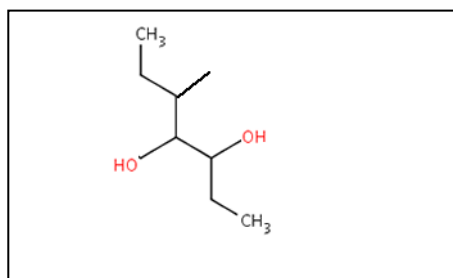
2-bromo-4-chloropent-3-ol



3-bromo-2-ethylpentandioic acid

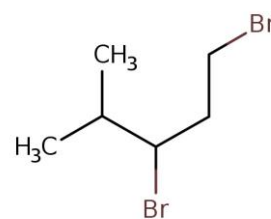


5-methylheptan-3,4-diol

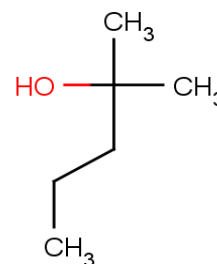
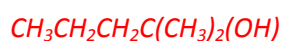


2) Draw the following molecules in skeletal form and give the semistructural formula

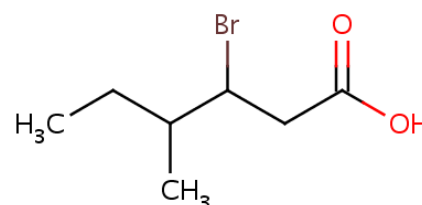
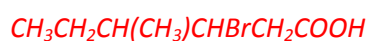
a) 1,3-dibromo-4-methylpentane



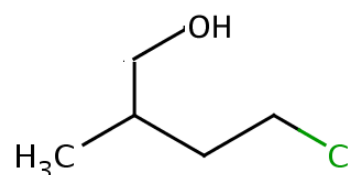
b) 2-methylpentan-2-ol



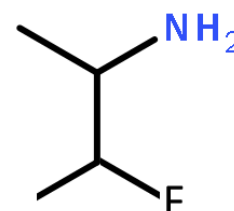
c) 3-bromo-4-methylhexanoic acid



d) 4-chloro-2-methylbutan-1-ol



e) 3-fluorobutan-2-amine



3) Draw the structure and name an alkane with the molecular formula C_6H_{12}

