In this segment we will explain what functional groups are and how to name molecules with specific functional groups. A **functional group** is a molecule or group of molecules bonded in a specific way to each other that determines generic trends in the compounds reactivity and physical information (boiling points, density, etc). In organic chemistry, this generally means a special group of molecules other can carbon bonded to other carbons and hydrogen (simple carbon chain). An example of a functional group would be –OH, the alcohol functional group. A molecule with an alcohol functional group ends in the suffix –ol. An example of a molecule with the alcohol functional group would be methanol, CH_3OH.

Parent Compounds

Methanol's **parent** compound is methane. A parent compound is what the molecule would be if there was no unique functional group. So instead of having an –OH group, it would just be H, leaving methane. The parent compound for this molecule is methane, so methanol will begin with the prefix methan-, and end with –ol, which indicates it has an alcohol functional group.

Placement on the Molecule

Like the placement of branches on a carbon chain, location of the functional group is included in the nomenclature. Use the smallest number just like in branch nomenclature. If the functional group is placed on the beginning of a chain, you don't need to include the number in your nomenclature. For example, our example of methanol is on the beginning of the one carbon long chain, so it wouldn't be named 1-methanol.

To summarize, the suffix of your molecule's name is dependant on the functional group present. Methane has the alkane functional group, so the name is composed of meth- for the carbon chain, and –ane for the alkane functional group. Similarly, methanol has a methane carbon parent chain resulting in the methan- prefix, and –ol to indicate the alcohol functional group.

A table of the different kinds of functional groups, their suffixes, and an example can be found

on this website:

[LINK URL: http://masterorganicchemistry.com/2011/02/14/table-of-functional-group-priorities-for-nomenclature/]

Otherwise there is a table of the name of the functional group and their suffixes with an example below.

Functional Group	**Naming**	**Ex**
Carboxylic Acid	-oic acid	propanoic acid
Ketone	-one	propanone
Alcohol	-ol	ethanol
Aldehyde	-al	propanal
Ether	-oxy-,-ane	ethoxybutane
Ester	-anoate	ethylbutanoate
Halide		
fluoro-		
chloro-		
fluorobutane		
chlorobutane		
bromobutane		
Amine	-amine	propylamine

Concept Definition

Study the primary definition of this concept, broken into general, basic, and advanced English definitions. Also see the mathematical definition and any requisite background information, such as conditions or previous definitions.

Basic

A functional group is a specific group of elements bonded together in a particular way in a molecule.

Advanced

A functional group is a specific group of elements organized in a specific way on the molecule that determine the molecules chemical reactivity.

Vocabulary

Learn important vocabulary for this concept, including words that might appear in assessments (tests, quizzes, homework, etc.) that indicate the use of this concept.

Important Vocabulary

Term	Context
Functional Group	**A specific group of molecules bonded together in a specific way on the m**
Parent Compound	**What the molecule would be if the functional group wasn't on the molecu**

Videos

Browse relevant videos from the Journal of Chemical Education's (JCE) Chemistry Comes Alive! library and other video sources.

Functional Groups

functional groups

Study Aides

Uncover helpful study tools, such as a mnemonic device or alternative ways to master the concept.

Study Aides

Some practice problems (with introduction) can be found here:

[LINK URL: http://chemed.chem.purdue.edu/genchem/topicreview/bp/2organic/function.html]

These questions are slightly more difficult, but include functional group questions:

[LINK URL: http://chemed.chem.purdue.edu/genchem/topicreview/bp/2organic/function.html]

More functional group problems here:

[LINK URL: http://highered.mcgraw-hill.com/sites/0072828374/student_view0/chapter4/practice_problems.html]

Sample Problems

Explore sample problems from the JCE QBank and other sources.

Sample Problems