

Introduction to Physical Science

Alcohols & Ethers
Presented by Robert Wagner

Alcohols

- An alcohol is a hydrocarbon in which the hydrogen atom has been replaced by an -OH group
 - This is not a base even though it has the -OH
 - Bonding with carbon is a covalent bond and not an ionic bond as in the bases like NaOH
- Ethanol - the alcohol in beer, wine and other drinks
 - Fermented sugars

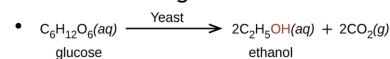
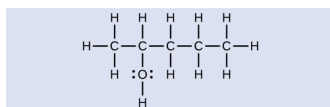


Image Credit: OpenStax Chemistry Chapter 20.2 CC BY 4.0

Naming Alcohols

- Name comes from the underlying hydrocarbon structure
 - The final -e in the name of the hydrocarbon is replaced by -ol
 - The number indicates the carbon atom to which the -OH group is bonded



Number of carbon atoms?

5 = Pentane (if no -OH)

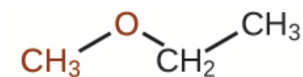
Becomes Pentanol

2-Pentanol since the -OH group is bonded to carbon atom #2

Image Credit: OpenStax Chemistry Example 20.8 CC BY 4.0

Ethers

- Ethers are hydrocarbons with a functional group -O-
- IUPAC name:
 - The smaller group gets -oxy added to it
 - Continue with the larger carbon chain
- Common name:
 - Two branches named separately followed by ether



methoxy

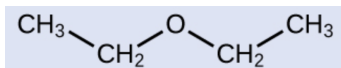
methoxyethane

ethylmethyl ether

Image Credit: OpenStax Chemistry Table 20.1 CC BY 4.0

Example

- Provide the IUPAC and common name for the ether shown here:



Both sides have two carbon atom chains

Ethane

So, ethoxyethane would be the IUPAC name

Both are ethyl groups, so the common name would be:

Diethyl ether

Image Credit: OpenStax Chemistry Example 20.9 CC BY 4.0

Summary

- Alcohols - hydrocarbon base with a hydrogen replaced by an -OH group
- Ethers - hydrocarbons with an -O- functional group
- Compounds have multiple names - an IUPAC name as well as a common name