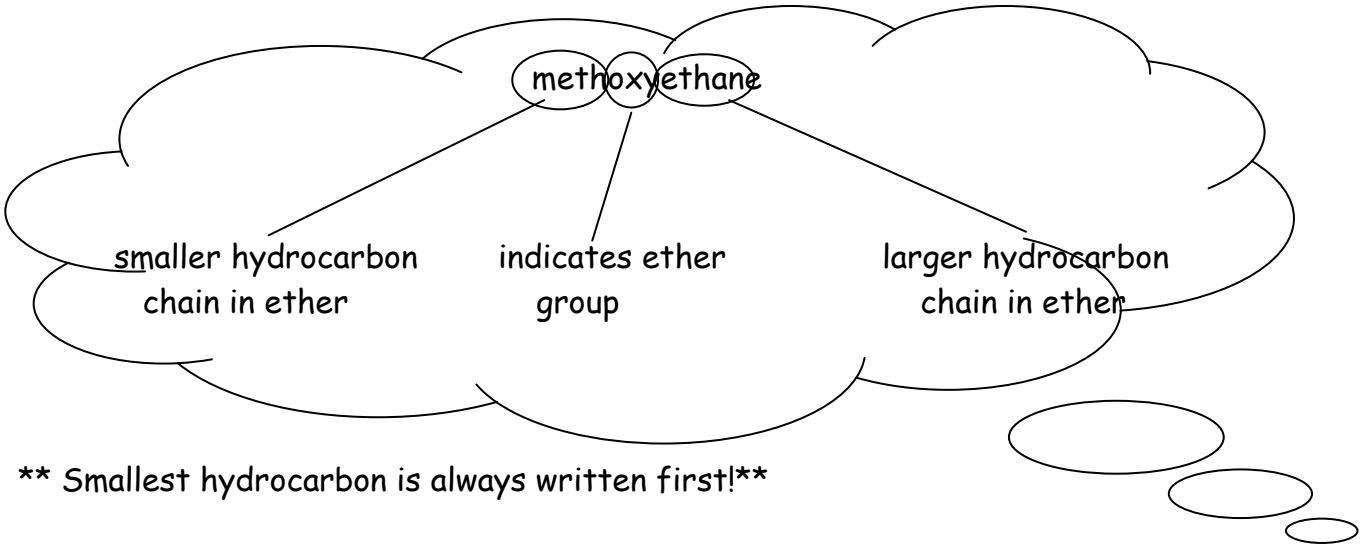
Ethers

Ethers take the general form of:

R – O – R

The functional group that is common to all ethers is an oxygen atom single bonded to two carbon atoms. An ether consists of a hydrocarbon chain linked to oxygen then another hydrocarbon chain linked on the other side of the oxygen atom.

Naming Ethers/Determining Formulas:



** Smallest hydrocarbon is always written first!**

Properties of Ethers:

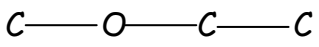
- more polar than hydrocarbons because of C—O bonds (oxygen is more electronegative)
- boiling point of ethers is slightly higher than hydrocarbons, but lower than alcohols
- like alcohols, ethers are good solvents for organic reactions because they readily mix with polar and non-polar substances.

Compound	Structure	Boiling point (°C)
ethane	$CH_3–CH_{3(g)}$	–89
methoxymethane (dimethyl ether)	$CH_3–O–CH_{3(g)}$	–23
ethanol	$CH_3–CH_2–O–H_{(l)}$	78.5

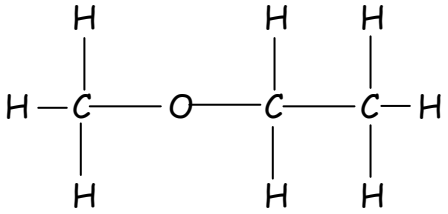
Example 1: Draw the structural diagram and determine the formula for:

methoxyethane.

Step 1: draw carbon backbone with oxygen:



Step 2: fill in remaining positions with hydrogen bonds



or

$CH_3OCH_2CH_3$ or C_3H_8O

Example 2: Write the name of the ether that has the condensed structural formula $CH_3CH_2CH_2CH_2OCH_3$.
Step 1: count carbon atoms in each chain to determine prefix and suffix

Step 2: look at a functional group

Step 3: put together name, remembering that the smallest hydrocarbon chain is listed first

methoxybutane

Hmrk: Determine the structural formula, condensed structural formula and formulas for:

a) methoxymethane
b) ethoxyhexane
c) ethoxyethane (also called diethyl ether)