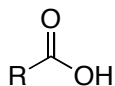
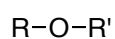


**Alcohols, Ethers, Carbohydrates****Nomenclature**

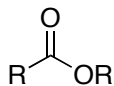
Alcohol R-OH      -OH is Hydroxy or Hydroxyl



Carboxylic acid



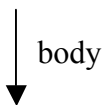
Ether R, R'  $\neq$  H



Ester

**Alcohol Nomenclature**

CH<sub>3</sub>OH      - methanol (wood alcohol, or methyl alcohol)  
Toxic



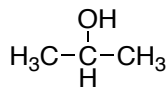
formaldehyde

CH<sub>3</sub>CH<sub>2</sub>OH      - ethanol (grain alcohol or ethyl alcohol)

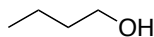
**Rules:**

- Find the longest chain with the OH and
- Number from end to give -OH the lowest number.
- Drop "e" of alkane, and add "ol"

CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>OH - propanol (propan-1-ol, n-propanol, or n-propyl alcohol)



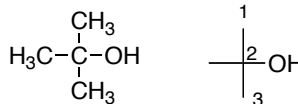
- 2-propanol (iso-propyl alcohol), rubbing alcohol



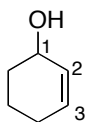
1-butanol  
butan-1-ol  
n-butanol



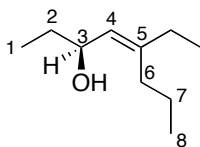
2-butanol



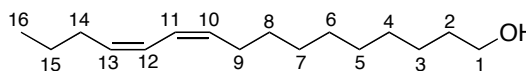
tert-butyl alcohol  
2-methyl-2-propanol  
2-methyl propan-2-ol



2-cyclohexen-1-ol or  
cyclohex-2-en-1-ol



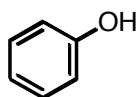
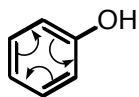
3-(s)-5-ethyl-4(Z)-octen-3-ol



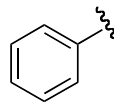
16C = hexadecane  
10,12 = Diene  
1 = ol

Hexadeca-10(Z)-12(Z)-dien-1-ol

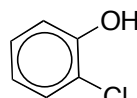
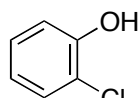
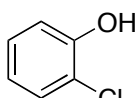
### Phenols (aromatic alcohols)



resonance forms



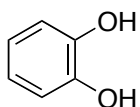
C<sub>6</sub>H<sub>5</sub> phenyl



not recommended

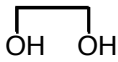


benzene C<sub>6</sub>H<sub>6</sub>

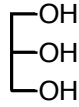


dihydroxybenzene (catechol)

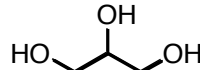
Common alcohols one needs to recognize:



Ethylene glycol (antifreezer)  
1,2-dihydroxyethane  
ethane-1,2-diol

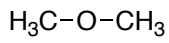


glycerol  
glycerine  
1,2,3-trihydroxypropane  
1,2,3-propanetriol

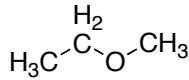


## Ether nomenclature

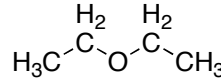
Rules: name both alkyl groups and add "ether"



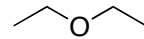
dimethyl ether  
methyl ether



ethyl methyl ether



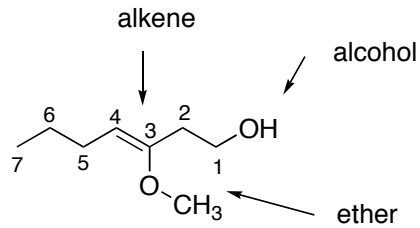
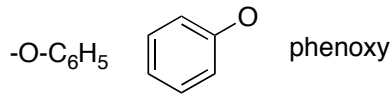
diethyl ether, ethyl ether, ether



-OR alkoxy group

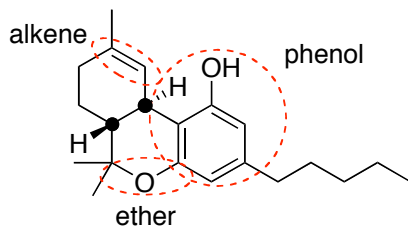
-O-CH<sub>3</sub> methoxy

-O-CH<sub>2</sub>CH<sub>3</sub> Ethoxy



3-methoxy-3(Z)-hepten-1-ol

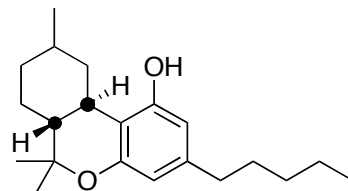
3-methoxy-(Z)-hept-3-en-1-ol



tetrahydrocannabinol (THC)  
CANNABIS SATIVA (HEMP)

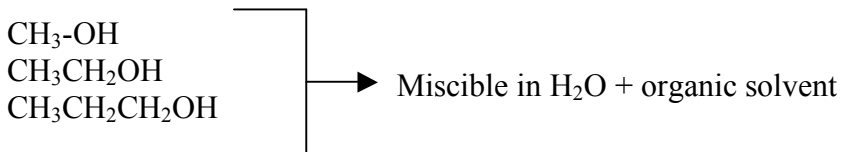
● 2-stereogenic centers

H<sub>2</sub>, Pd



## Physical Properties of Alcohols

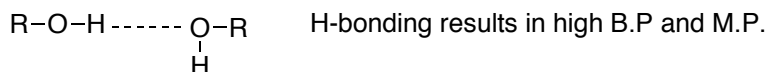
- R-O-H      - can donate and accept hydrogen bonds  
                 - polar, good solvents



- longer alcohols are generally not miscible with water.

e.g. CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>OH soluble in H<sub>2</sub>O, but not fully miscible in all amounts

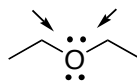
- less dense than water  $\rho < 1.0$
- good solvents for polar + non-polar compounds



	CH <sub>3</sub> OH	CH <sub>3</sub> CH <sub>3</sub>
MW	32	30
BP	+ 65°C	- 88°C

## Properties of Ethers

- non-polar (relatively), generally unreactive, especially to base
- have dipole-dipole interactions,

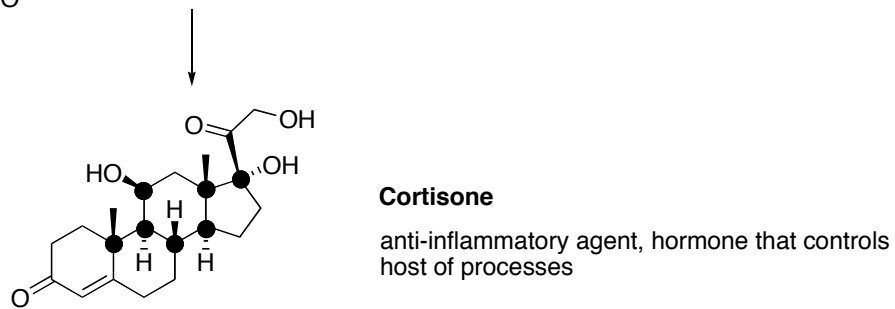
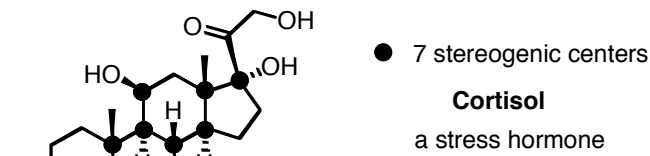
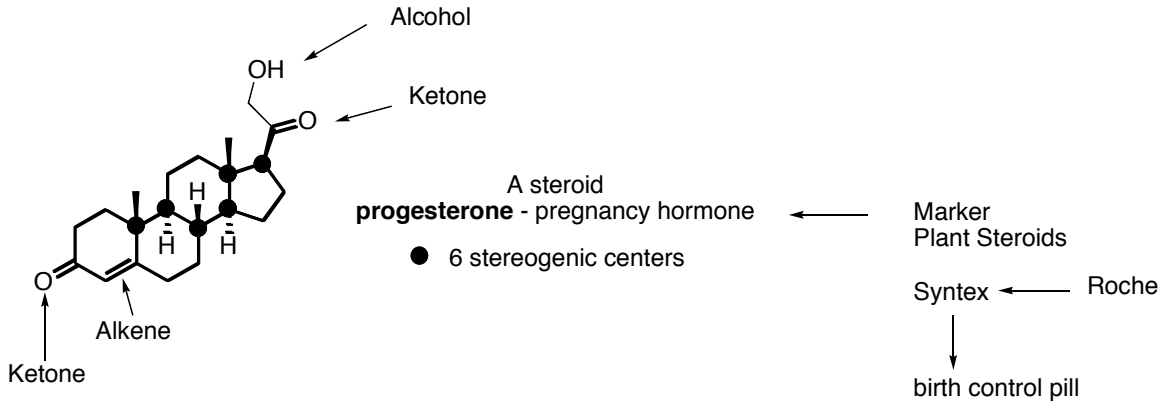


ethyl ether

- H-bond acceptors but NOT H-bond donors,
- not miscible with water, good solvents for organic compounds.
- low B.P. and M.P. than alcohols but higher than hydrocarbons.

eg. CH<sub>3</sub>CH<sub>2</sub>OCH<sub>2</sub>CH<sub>3</sub> BP = 35 °C

Some interesting examples – Functional Group & Structure Analysis



Structure elucidated by Prof. Reichstein (Nobel Prize)

and Dr. Von Euw

University of Basel