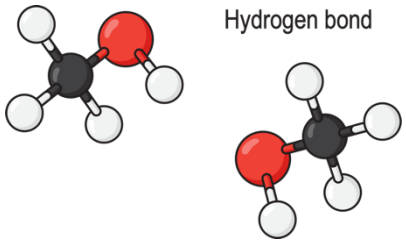
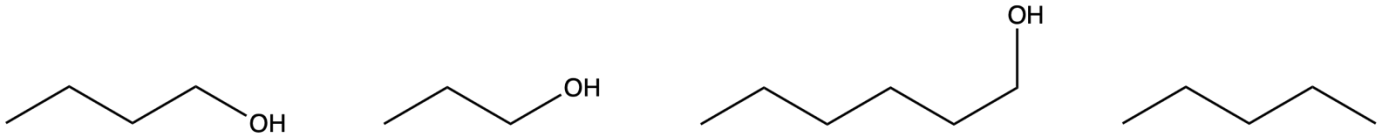
CONCEPT: PROPERTIES OF ALCOHOL



Boiling Point

- Alcohols have ___ boiling points than hydrocarbons or ethers of similar molar mass.
  - □ __ bonding between alcohol molecules makes them harder to _____.
    - _____ the C chain, ___ the boiling point.

EXAMPLE: Rank the following according to boiling point, from lowest to highest.



(I) (II) (III) (IV)

PRACTICE: Which of the following pairs of molecules accurately represents rankings of boiling point?

a) 2-octanol > 2-butanol

b) methanol > 1-propanol

c) isopropanol < propane

d) 1-hexanol < dipropyl ether

CONCEPT: PROPERTIES OF ALCOHOLS

Solubility

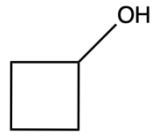
● Many alcohols are water soluble due to a _____ -OH group.

□ -OH group also allows for hydrogen bonding with water.

- Number of ___ atoms determines solubility.

• ≤ 3-C alcohols = _____.	• 4-C alcohols = _____ soluble.	• ≥5-C alcohols = __soluble.

EXAMPLE: Label each alcohol as soluble (S), slightly soluble (SS), or insoluble (I) in water.

a) 

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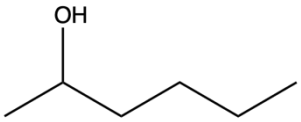
c) 

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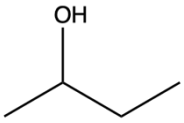
b) 

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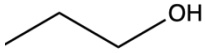
d) 

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PRACTICE: Select correct statement about alcohol solubility in water.

a) 2-hexanol is more soluble than 2-pentanol.

b) Methanol is soluble while butanol is slightly soluble.

c) Butane and 1-butanol have equal solubility.

d) 1-octanol is slightly soluble.

CONCEPT: PROPERTIES OF ALCOHOLS

Properties of Diols and Triols

● Diols and triols have ___ boiling points and are ___ soluble than similar _____hydric alcohols.

□ Multiple hydroxy groups strengthen intermolecular forces and increase polarity.

EXAMPLE: Circle molecule of each pair with the highest boiling point.

a) Hexanol or cyclohexane-1,3-diol.

b) Pentane-1,4-diol or 1-pentanol.

c) Butane-1,2-diol or propane-1,2,3-triol.

PRACTICE: Determine which molecule is most soluble in water.

a) Nonane-2,5,7-triol.

b) Propane-1,2,3-triol.

c) Butane-1,2-diol.

d) Butanol.