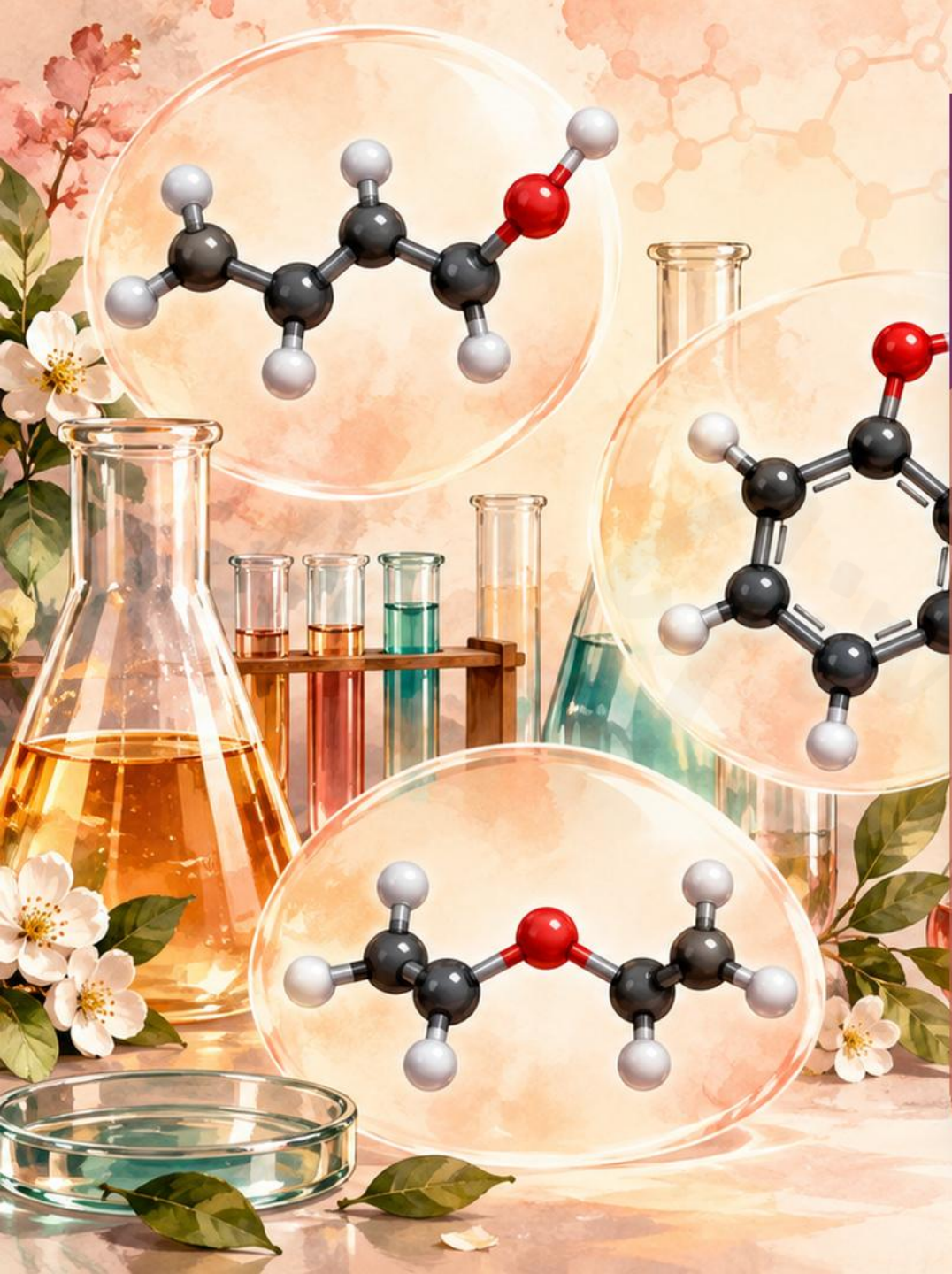




CHEMISTRY • CLASS 12

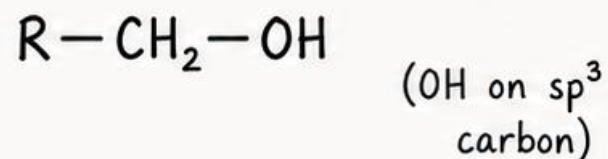
CHAPTER 7

Alcohols, Phenols and Ethers

CHAPTER NOTES

ALCOHOLS, PHENOLS AND ETHERS — OVERVIEW

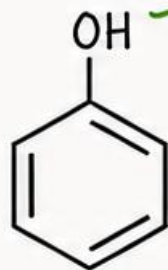
ALCOHOLS



Examples: CH_3OH
 CH_3CH_2OH

- hydroxyl group on saturated carbon
- hydrogen bonding
- oxidation and dehydration chemistry

PHENOLS



(OH on aromatic ring carbon)

Example: C_6H_5OH

- aromatic hydroxyl compound
- phenoxide resonance
- activated ring chemistry

ETHERS



Examples: CH_3OCH_3
 $C_6H_5OCH_3$

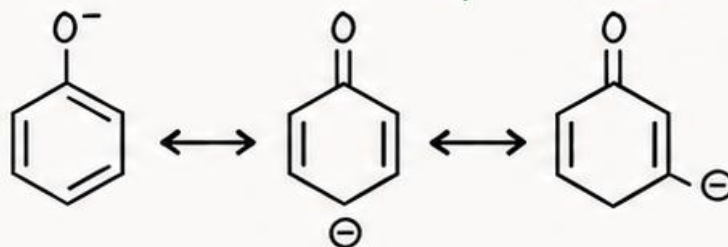
- oxygen links two carbon groups
- no self O-H hydrogen bonding
- cleavage by strong HI or HBr

Same oxygen atom — different bonding environment — different properties and reactions.

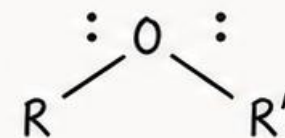
Hydrogen-bonded (alcohols)



Resonance-stabilized (phenoxide)



Bent geometry (ethers)

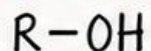


bond angle $\sim 104-110^\circ$

CLASSIFICATION AT A GLANCE

HYDROXY AND ETHER COMPOUNDS

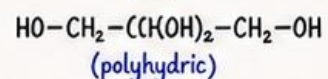
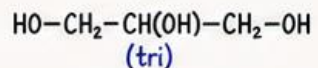
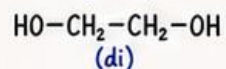
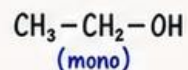
ALCOHOLS



OH on sp^3 carbon

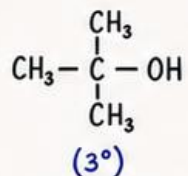
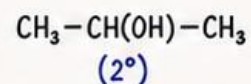
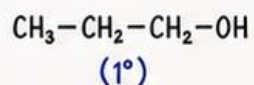
number of OH groups:

- mono
- di
- tri
- polyhydric



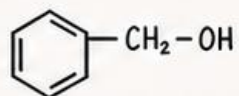
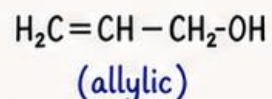
carbon bearing OH:

- primary
- secondary
- tertiary

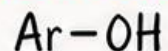


position:

- allylic
- benzylic

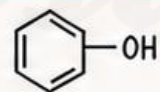


PHENOLS

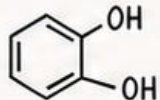


OH directly on aromatic ring carbon

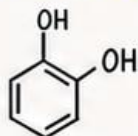
mono-, di-, trihydric phenols



phenol (monohydric)



resorcinol (dihydric)

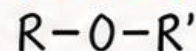


phloroglucinol (trihydric)

not classified as an alcohol

OH is on an aromatic carbon, not on an sp^3 carbon.

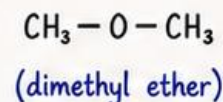
ETHERS



simple/symmetrical

both groups same

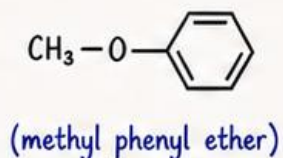
dialkyl ether



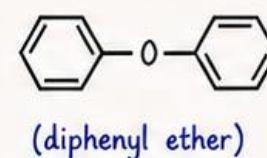
mixed/unsymmetrical

groups different

alkyl-aryl ether



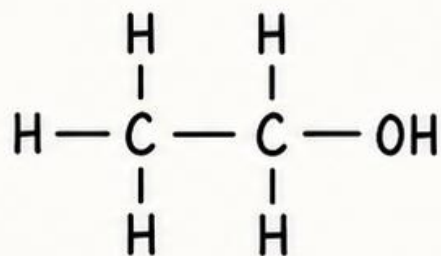
diaryl ether



Ask where the oxygen is bonded — saturated carbon, aromatic carbon, or between two carbon groups.

MONO, DI, TRI AND POLYHYDRIC ALCOHOLS

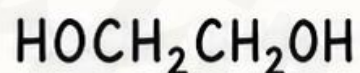
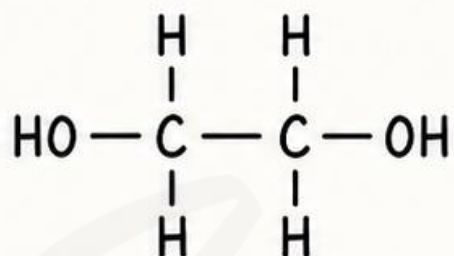
MONOHYDRIC



ethanol

1 -OH group

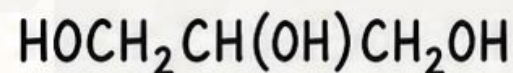
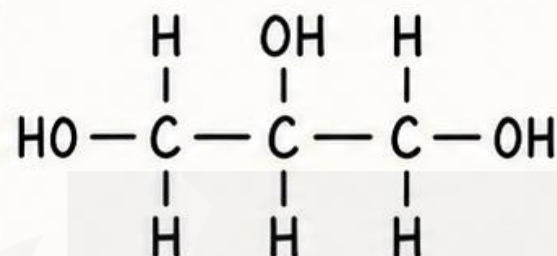
DIHYDRIC



ethane-1,2-diol

2 -OH groups

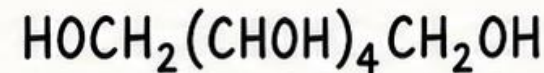
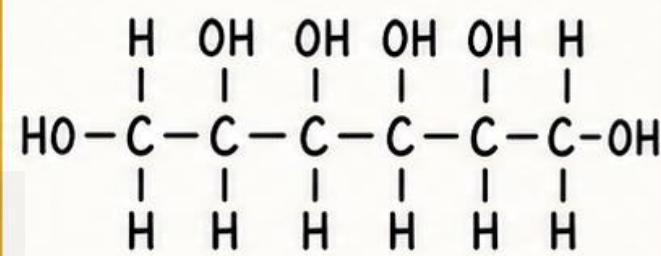
TRIHYDRIC



propane-1,2,3-triol

3 -OH groups

POLYHYDRIC



sorbitol

6 -OH groups

- Classification depends on the number of hydroxyl (-OH) groups.
- Do not count ether oxygen; only -OH groups are considered.
- Multiple -OH groups strongly increase hydrogen bonding.

1 OH

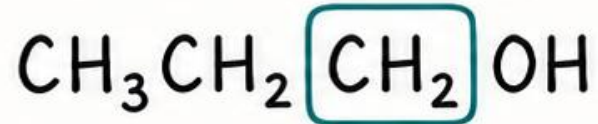
2 OH

3 OH

many OH groups

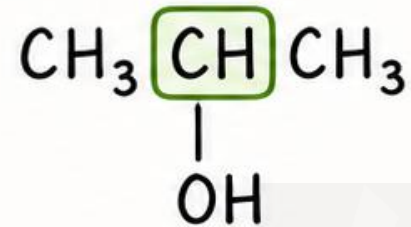
PRIMARY, SECONDARY AND TERTIARY ALCOHOLS

PRIMARY (1°)



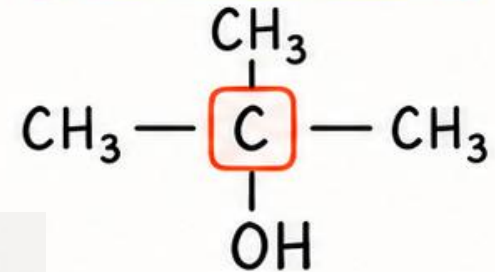
OH-bearing carbon is bonded to one carbon.

SECONDARY (2°)



OH-bearing carbon is bonded to two carbons.

TERTIARY (3°)



OH-bearing carbon is bonded to three carbons.

HOW TO DECIDE THE CLASS

Locate the carbon that bears OH.

Count how many carbon neighbours (direct C-C bonds) it has.

1 carbon

→ Primary (1°)

2 carbons

→ Secondary (2°)

3 carbons

→ Tertiary (3°)

COMPARISON (GENERAL TRENDS)

- COMMON MILD-OXIDATION OUTCOMES
 - Primary → aldehyde (then acid under stronger oxidation)
 - Secondary → ketone
 - Tertiary → usually resists mild oxidation
- EASE OF ACID-CATALYSED DEHYDRATION
 - Tertiary > Secondary > Primary
 - (Forms alkenes as major products.)

The class belongs to the carbon that bears OH — not to oxygen and not to total chain length.

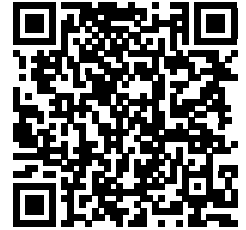


FREE PREVIEW

[Click here to visit our website](#)

SCHOOL NOTES & NCERT SOLUTIONS

Complete notes and
NCERT solutions are
available on
FirstHope app only.



[Scan or click here](#)

Click here to get the app

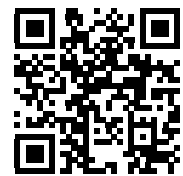


Available on Google Play

JOIN THE FIRSTHOPE COMMUNITY

Join our Telegram channel

Click here to join Telegram



[Scan or click here](#)

@FirstHope_CBSE_Notes

Instagram

@firsthope.school

[Click here to follow >](#)

YouTube channel

@firsthope.school

[Click here to watch >](#)

FirstHope website

firsthope.co.in

[Click here to visit our website >](#)

CBSE / Class 9 / Class 10 / Class 11 / Class 12

Preview notes and NCERT solutions. Full PDFs in the FirstHope app.