

CHEMISTRY STUDY MATERIALS FOR CLASS 12

(NCERT Based Notes of Chapter - 11)

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DATE:- 15/09/2021

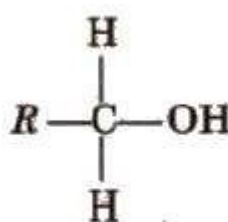
Alcohols, Phenols and Ethers

Alcohols and Phenols

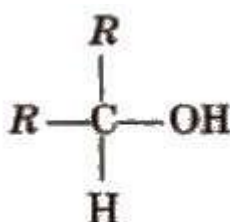
Alcohols and phenols are formed when a hydrogen atom in hydrocarbon, aliphatic and aromatic respectively, is replaced by hydroxyl group (-OR group).

Classification of Alcohols and Phenols

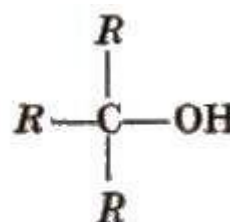
In alcohols, -OR group is attached to Sp^3 hybridised carbon. These alcohols are usually classified as primary, secondary and tertiary alcohols.



primary (1°)



secondary (2°)



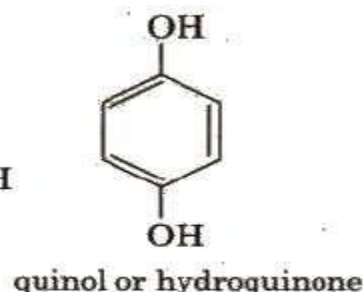
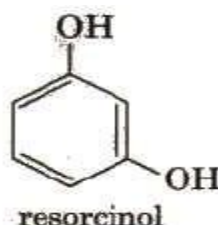
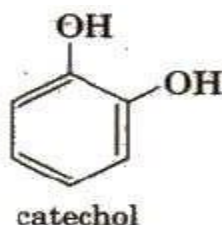
tertiary (3°)

Alcohols may be

- (i) Monohydric-containing one - OR group,
- (ii) Dihydric-containing two - OR groups and
- (iii) Polyhydric-containing three or more -OR groups.

In phenols, -OR group is attached to Sp^2 hybridised carbon. These may also

be monohydric, dihydric, etc. The dihydric phenol further may be ortho, meta' or para derivative.

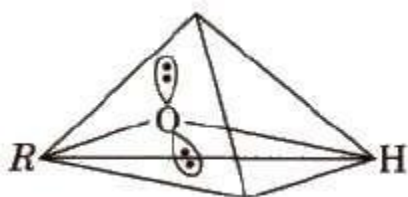


In allylic alcohols, – OH group is attached to sp^3 hybridised carbon but next to C=C bond.

e.g., $CH_2 = CH - CH_2OH$, Benzylic alcohol ($C_6H_5CH_2OH$)

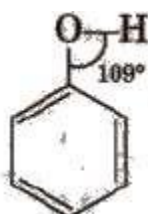
Structure of Alcohols and Phenols

The oxygen atom of alcohols is Sp^3 hybridised and they have tetrahedral position of hybrid atomic orbitals.



The value of LROH bond angle depends upon the R group. For methyl alcohol, it is ($\angle C - O - H$) 108.9° due to repulsion of lone pairs.

In phenols, the – OH group is attached to Sp^2 hybridised carbon and thus, the C – O bond acquires a partial double bond character.



Nomenclature of Alcohols and Phenol

In IUPAC, system, alcohol or alkanols are named by replacing the last word 'e' of the corresponding alkane by 'ol'. e.g,

