

# CHEMISTRY

**Live** eBook



## 01. Tautomerism

### Tautomerism and Desmotropism

Tautomerism was introduced by "Laar". It's also called desmotropism.

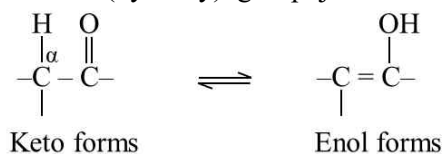
- Desmotroism means bond turning. [Desmos = Bond ; Tropos = Turn]
- Tautomers have same molecular formula but different structural formula due to wandering nature of active hydrogen between two atoms.
- The tautomerism is also called **kryptomerism or allotropism or desmotropism or dynamic isomerism**.

### Conditions for tautomerism

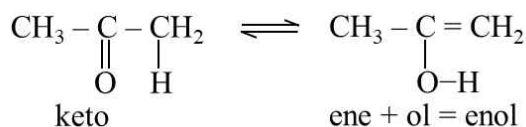
- Presence of groups like  $>C = O$ ,  $-N = O$ ,  $>C = N-$  &  $\alpha$ -H with respect to these groups.
- In order for conversion of a keto form to its enol form it must have an  $\alpha$ -hydrogen (i.e., hydrogen attached to the carbon adjacent to the carbonyl group).

### Keto – Enol Tautomerism

- When the tautomers exist in the two forms keto & enol then, such type of tautomerism is called keto-Enol tautomerism.
- It was discovered by the scientist 'Knorr' in 1911 in acetoacetic ester.
- The Keto means the compound has a Keto group  $>C = O$ , and the enol form has both double bond and OH (hydroxy) group joined to the same carbon.

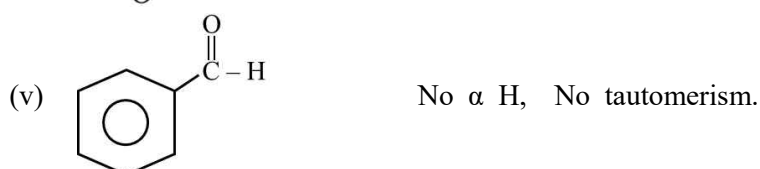
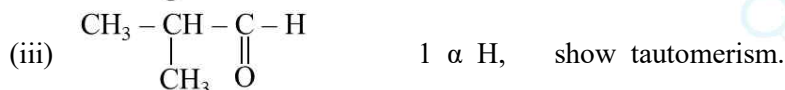
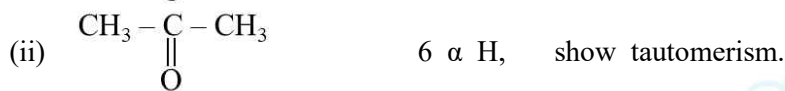


### Example

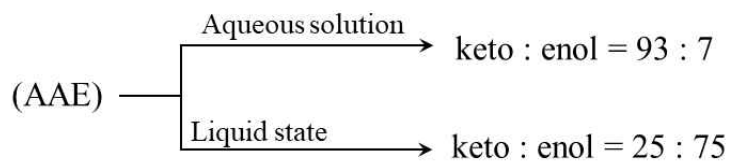


### Condition for Tautomerism

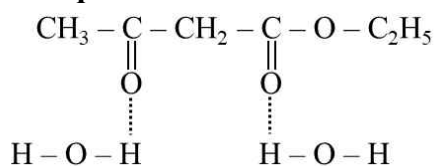
(a) **For carbonyl compounds** : Carbonyl compounds having at least one  $\alpha$ -OH show tautomerism.





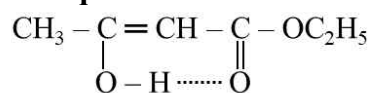


**In aqueous solution**



- Keto form is stabilised by intermolecular H-Bonding.

**In liquid state**



- Enol form is stabilised by intermolecular H-Bonding.

