

MOLECULAR VIBRATIONS

Fundamental Vibrations

Non-fundamental Vibrations

Stretching Vibration

Bending Vibration

**Over Tones,
Combination Tones,
Fermi Resonance**

Symmetric

Asymmetric

In-plane Bending

Out Of Plane Bending

Scissoring

Rocking

Wagging

Twisting

FUNDAMENTAL VIBRATIONS

Fundamental vibration is also divided into types:

STRETCHING VIB.

- 1. Stretching vibration involves a continuous change in the inter atomic distance along the axis of the bond b/w 2 atoms.*
- 2. It requires more energy so appears at shorter wavelength.*

BENDING VIB.

- 1. Bending vibrations are characterized by a change in the angle b/w two bonds.*
- 2. It requires less energy so appears at longer wavelength.*

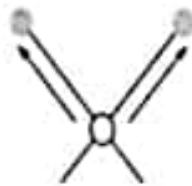
Now, stretching vibration is further divided into :

SYMMETRIC VIB.

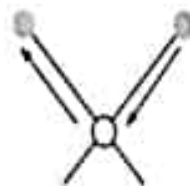
- *Inter atomic distance b/w 2 atoms increases/decreases.*

ASYMMETRIC VIB.

- *Inter atomic distance b/w 2 atoms is alternate/opposite.*



Symmetric



Asymmetric

In-plane bending further divided into:

SCISSORING:

*When 2 atoms
move away or
close towards
each other.*

ROCKING:

*Change in angle
b/w a group of
atoms.*

Out plane bending is further divided into:

