

COMPARISON OF VIBRATIONAL SPECTROSCOPIES

An infographic by Instruments & Data Tools

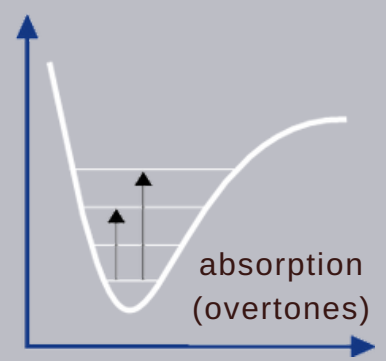
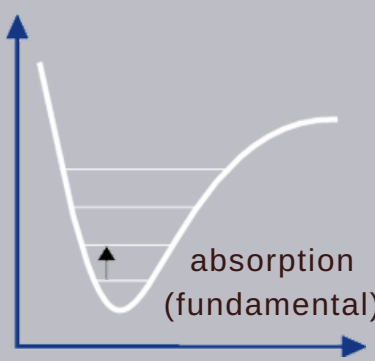
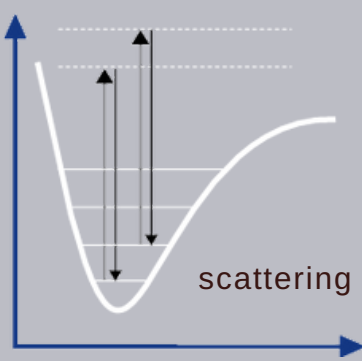
RAMAN

MIR

NIR



Physical principle



Range

4000-50 cm^{-1}
or
2.5-200 micron

4000-200 cm^{-1}
or
2.5-50 micron

12500-4000 cm^{-1}
or
0.8-2.5 micron



Light source

Laser (monochromatic)

Global tungsten (polychromatic)

Global tungsten (polychromatic)



Sensitive to

Vibrations of homonuclear functionalities e.g.
C=C C-C S-S

Vibrations of polar functionalities e.g.
C-F Si-O C=O C-O

Overtones and combination bands of
CH OH NH functionalities



Sample prep

Little or none



Required (except ATR)



Little or none



Sample thickness

★ micron range

★ micron range

★ cm range



Structural selectivity

High

High

Low

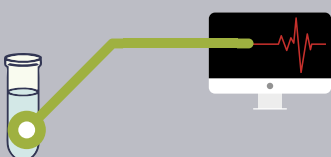


Optical coupling and measurement distance

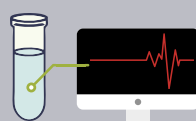
Optics fibre optics

Free space

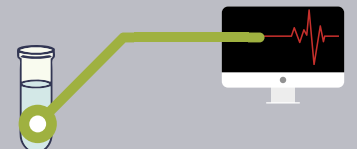
Optics fibre optics



Long distance



Very short distance



Long distance

