

Ultraviolet And Fluorescence Spectroscopy

from chapter _____ in the recommended text

A. Introduction

B. Fundamental Physics

more

X-ray

ground state energy level to a(n) excited

inversely proportional to the energies

directly related to their energies.

broad

X-ray

Chromophores

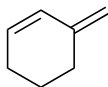
cross-section and the more

C. Molecular Orbital Diagrams Of Alkenes, Dienes, and Polyenes

more than one single



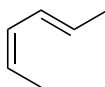
non-conj'd



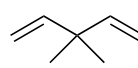
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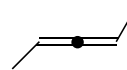
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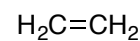
conj'd



non-conj'd



non-conj'd



non-conj'd



conj'd



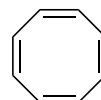
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conj'd



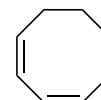
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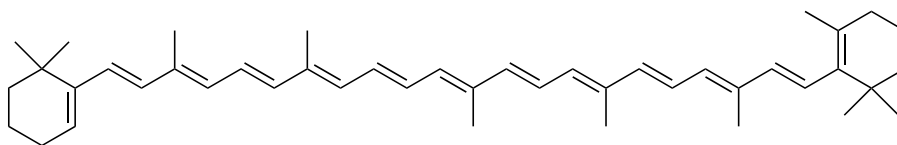
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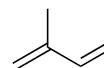
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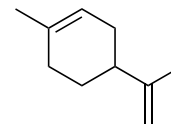
conj'd



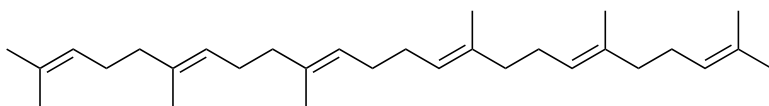
β -carotene conj'd



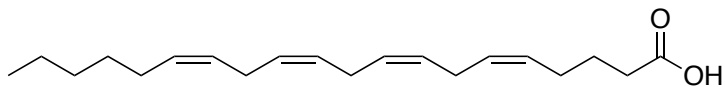
isoprene
conj'd



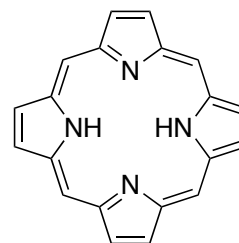
limonene
non-conj'd



squalene non-conj'd

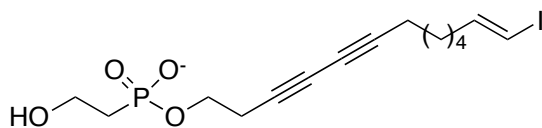


arachidonic acid non-conj'd

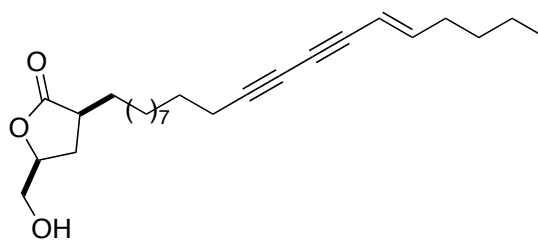


porphyrin conj'd

is



phosphatidyl A
non-conj'd



debrisoquine
conj'd

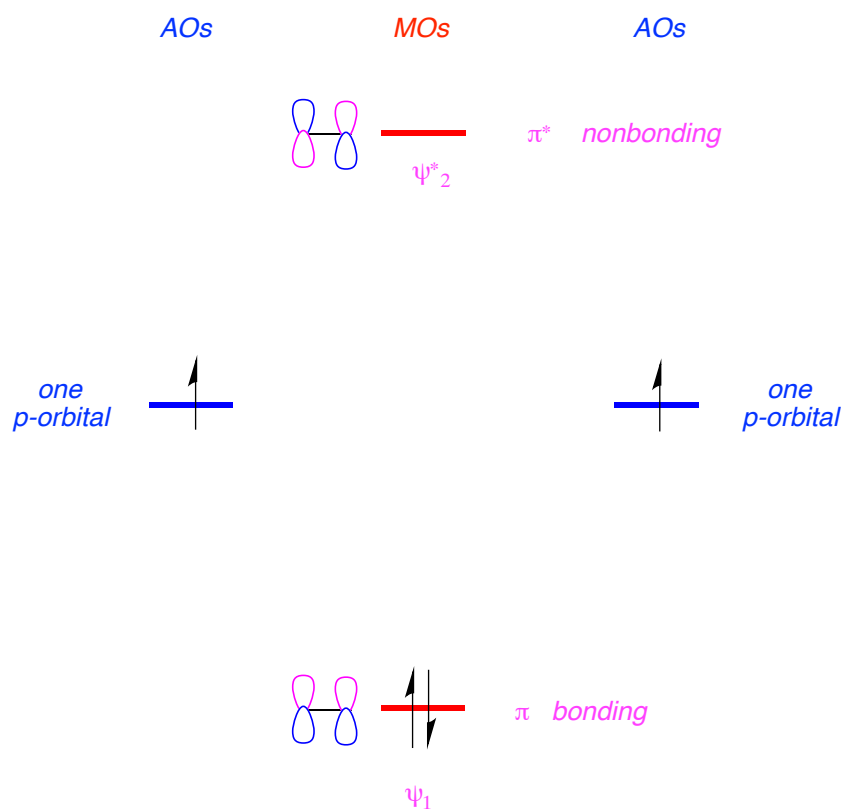
an alternative to

n

2

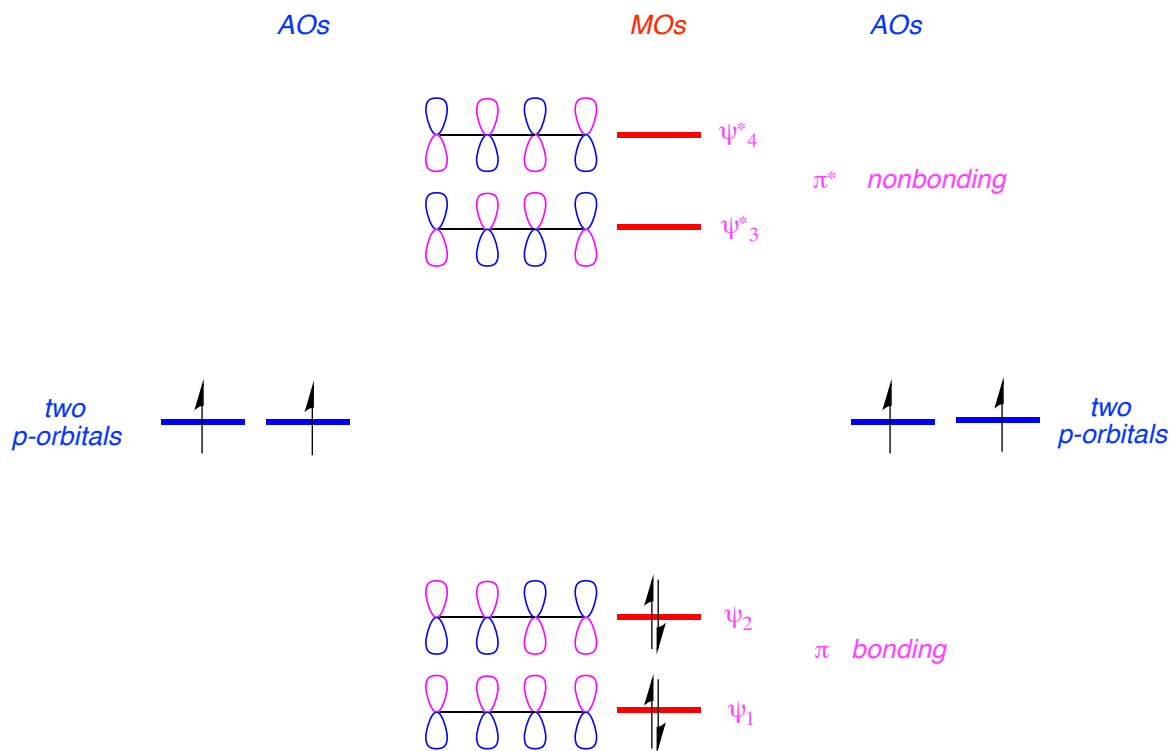
bonding π - and antibonding

Maximal



ultraviolet region resulting in an excited
IR energy

larger cross-sections, therefore they absorb more
absorbance of the chromophore
larger



decreases

lower energy quanta of increased

vibrational energy states, while electronic

IR

UV quanta.

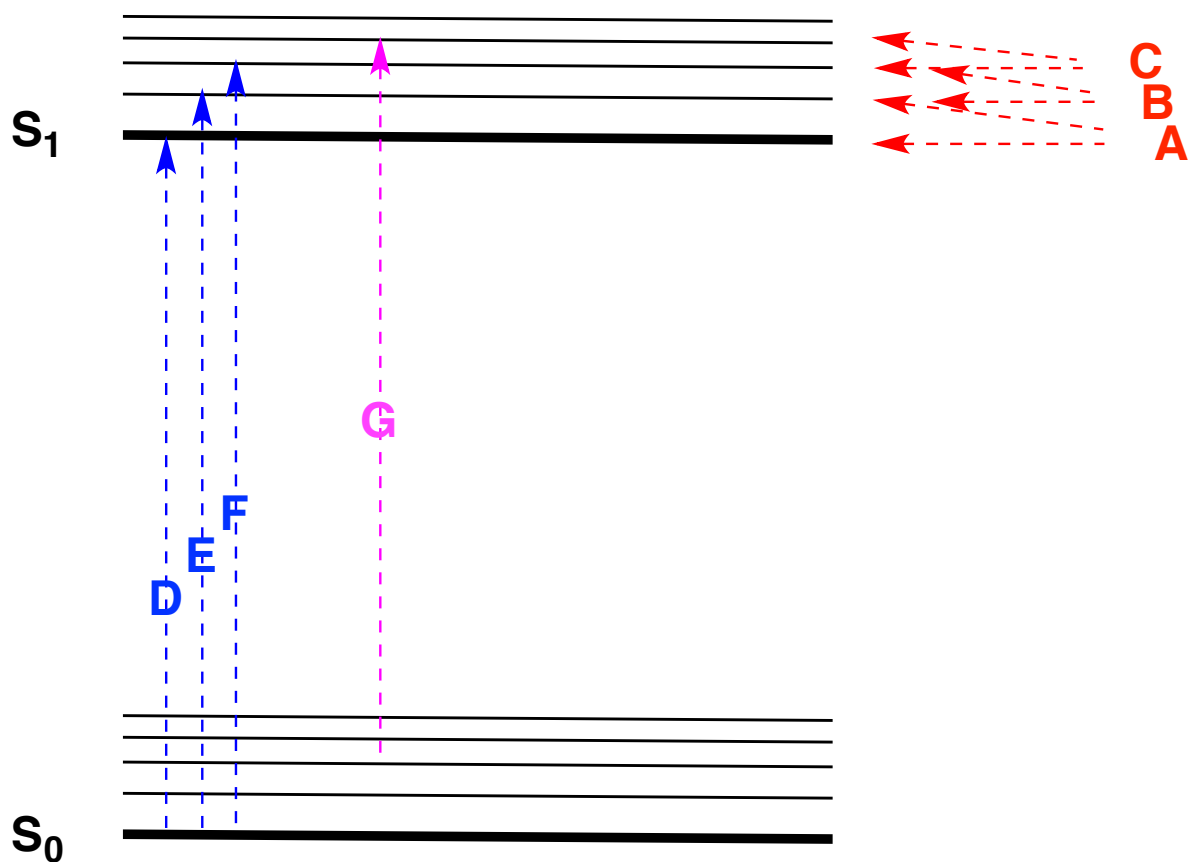
UV

IR.

IR

UV

greater than for transitions like **G**.



multiple

lower

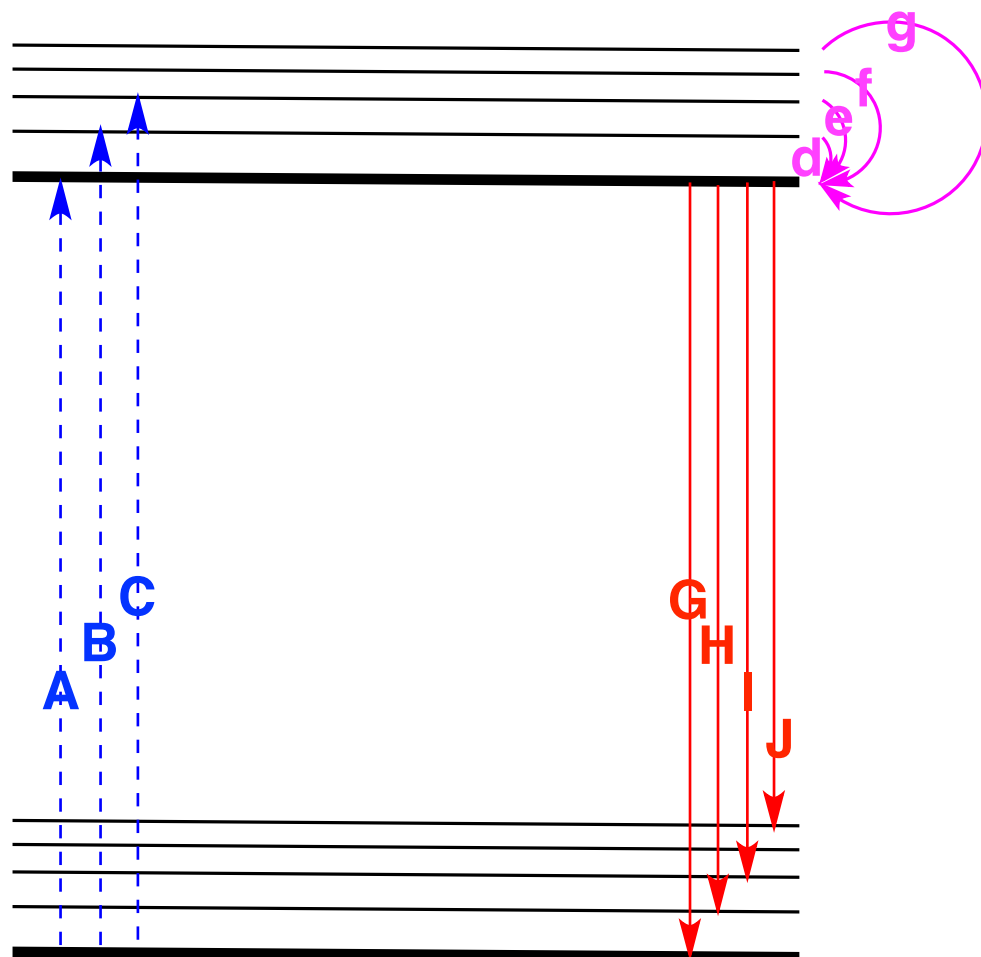
UV and transitions between electronic

IR emissions.

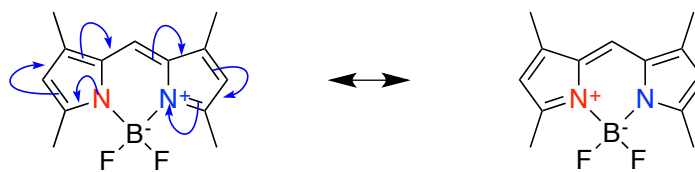
nano-second

fluorescent radiation

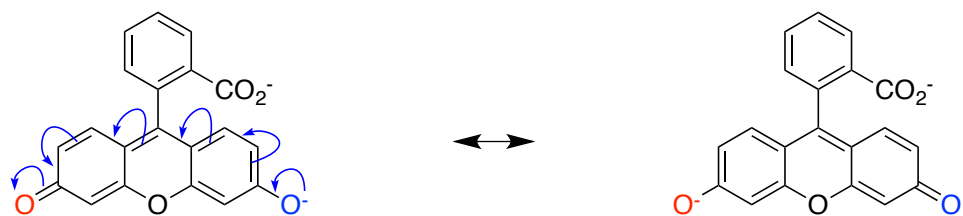
rigid molecules



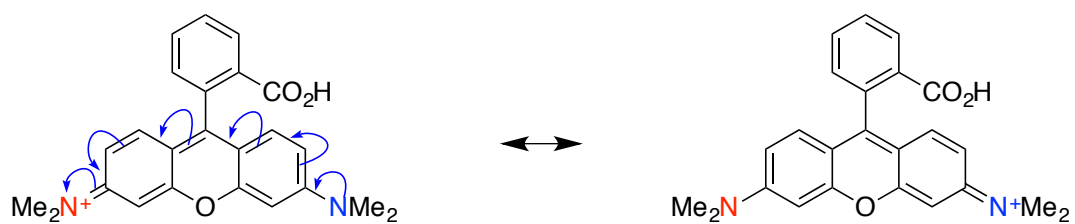
sensitive
higher
higher
fluorescence spectroscopy
fluors.
less
rigid



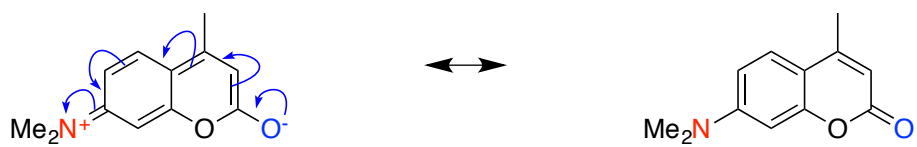
a BODIPY



a fluorescein



a rhodamine



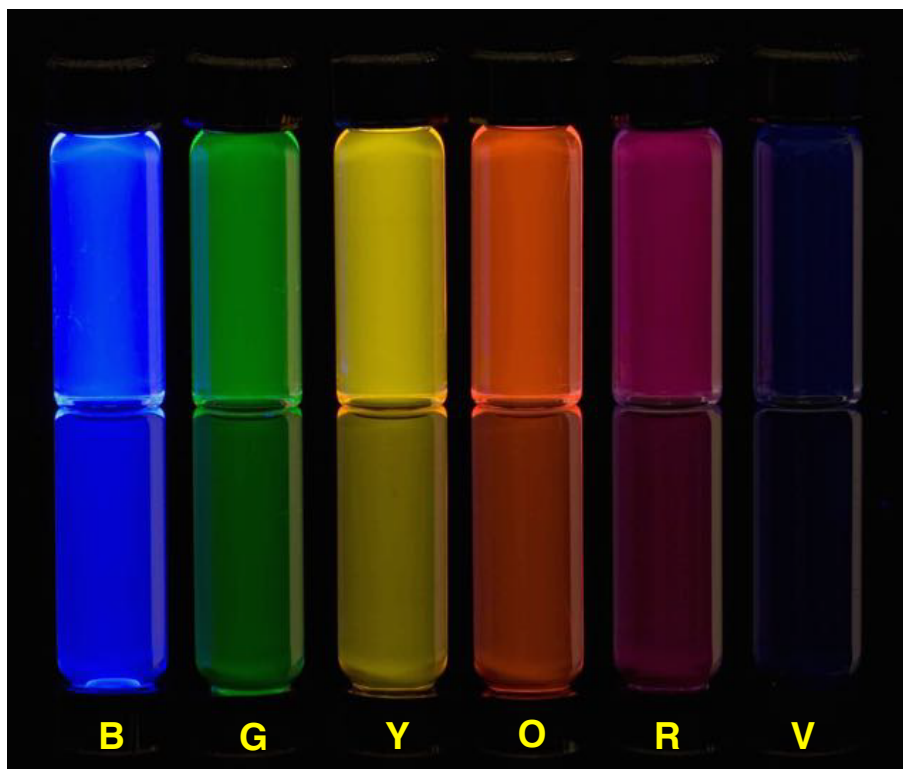
a coumarin

Of the probes shown above, the ones which has fluorescence that is most sensitive to reduced pH is the fluorescein, whereas the BODIPY is least sensitive to pH.

This is because fluorescein contain phenoate-O⁻ groups that can be protonated as the pH is reduced from 7.0.

Fluorescence of the BODIPY / fluorescein / rhodamine / coumarin is likely to be most sensitive to the dipole moment of the solvent it is in because the oscillation of charge in this molecule is unsymmetrical.

Which of the fluor solutions below emit the highest energy light B, and which of them emit at the longest wavelength V.



Circle the correct definition of fluorescence quantum yield from the following choices:

$$\frac{\text{\# photons absorbed}}{\text{\# photons emitted}}$$

$$\frac{\text{\# photons emitted}}{\text{\# photons absorbed}}$$

$$\frac{\text{\# photons lost as heat}}{\text{\# photons absorbed}}$$

Circle the correct descriptor of fluor brightness:

$$\text{quantum yield} \times \text{absorbance at excitation wavelengths}$$

$$\text{quantum yield} \times \text{absorbance at } \lambda_{\text{max}}$$

absorbance at excitation wavelengths only

quantum yield only

absorbance at λ_{max} only