ORGANIC CHEMISTRY 1 LECTURE GUIDE 2019

BY RHETT C. SMITH

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Executive Editor: Rhett C. Smith, Ph.D. You can reach him through our office at: IQ@protonguru.com

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Organic Chemistry 1
Lecture Guide 2019

By Rhett C. Smith, Ph.D.

Companion Books from the Proton Guru:

Organic Chemistry 1 Reactions and Practice Problems 2019

by Rhett C. Smith

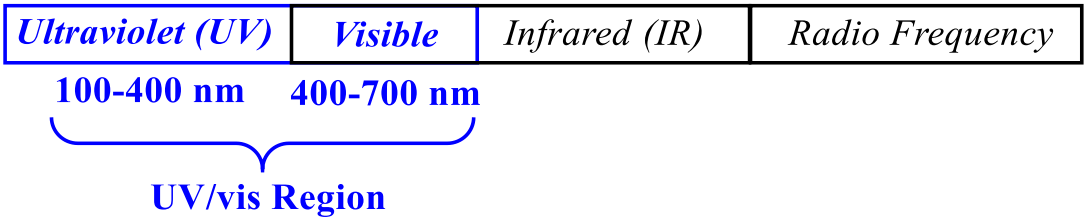
Organic Chemistry 1 Primer 2019,

by Rhett C. Smith, Andrew G. Tennyson, and Tania Houjeiry

Different energies of light elicit different changes in molecules that absorb them. In this course, we will consider UV, visible, IR and radio frequency radiation:

higher energy

lower wavelength

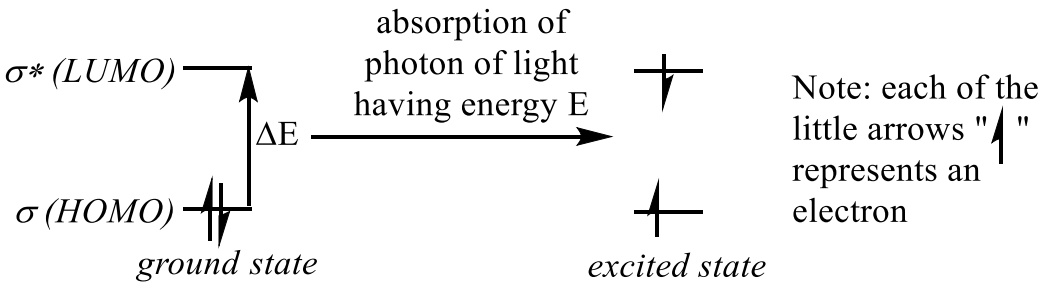


First, we will focus on how UV and visible light, collectively abbreviated UV–visible (UV/vis) light, interact with organic molecules. The UV/vis part of the spectrum we will consider spans a wavelength range from ~100–700 nm.

Notes

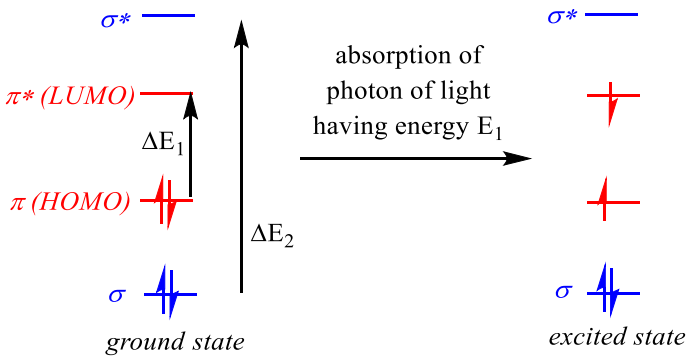
When a molecule absorbs UV/vis radiation of an appropriate energy, it causes one of the electrons to undergo an **electronic transition** from the highest occupied molecular orbital (HOMO) to the lowest unoccupied molecular orbital (LUMO).

An electron in a σ-bond gets promoted to a **σ-antibonding (σ*) orbital**:



Notes

An electron in a π-bond gets promoted to a **π-antibonding (π*) orbital**:



Compared to the σ→ σ* transition, the π→ π* is:

A

Furthermore, the longer the π conjugated system, the lower the energy of the photon needed to promote the π→π* transition.

B

Notes