Types of shifting

1- Bathochromic shift (red shift) :
a shift to lower energy or lower wavelength.

2- Hypsochromic shift (blue shift) :
a shift to high energy or shorter wavelength.

3- Hyperchromic effect : an increase in intensity.

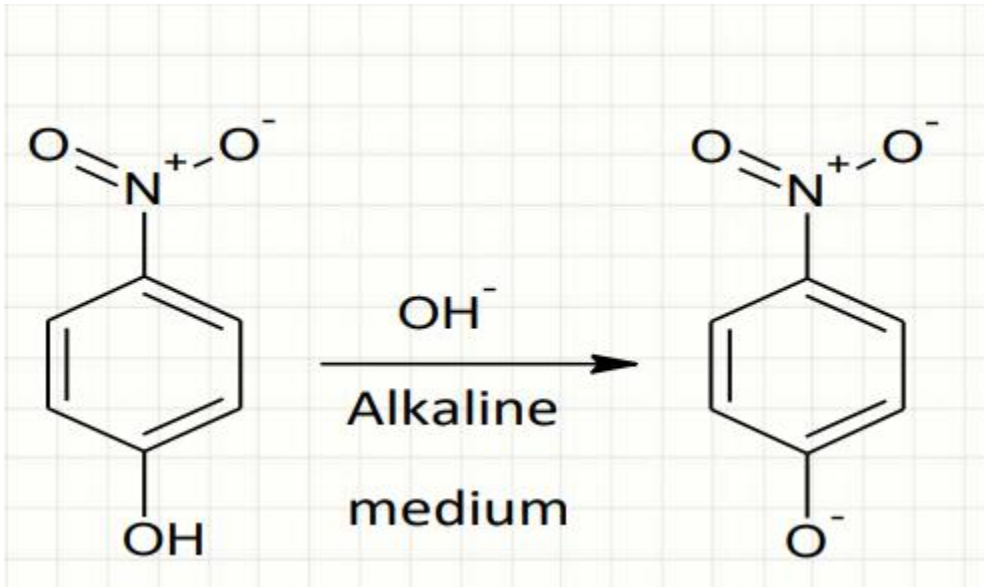
4- Hypochromic effect : a decrease in intesity.

Bathochromic Shift (Red Shift)

- When absorption maxima (λmax) of a compound shifts to longer wavelength, it is known as bathochromic shift or red shift.
- The effect is due to presence of an auxochrome or by the change of solvent.
- e.g. An auxochrome group like –OH, -OCH3 causes absorption of compound at longer wavelength.

Bathochromic Shift (Red Shift)

- In alkaline medium, p-nitrophenol shows red shift. Because negatively charged oxygen delocalizes more effectively than the unshared pair of electron.



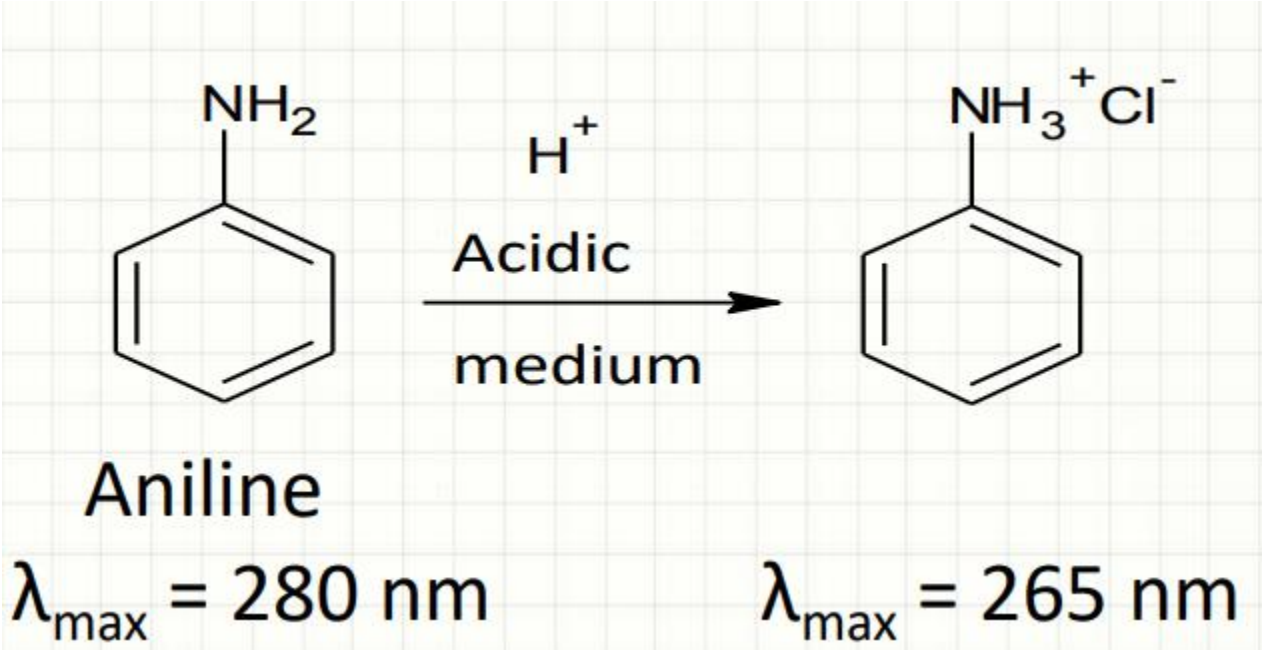
λ_{max} = less than λ_{max}

Hypsochromic Shift (Blue Shift)

- When absorption maxima (λmax) of a compound shifts to shorter wavelength, it is known as hypsochromic shift or blue shift.
- The effect is due to presence of an group causes removal of conjugation or by the change of solvent.

Hypsochromic Shift (Blue Shift)

- Aniline shows blue shift in acidic medium, it loses conjugation.

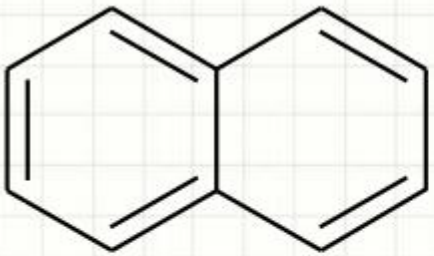


Hyperchromic Effect

- When absorption intensity (ε) of a compound is increased, it is known as hyperchromic shift.
- If auxochrome introduces to the compound, the intensity of absorption increases.

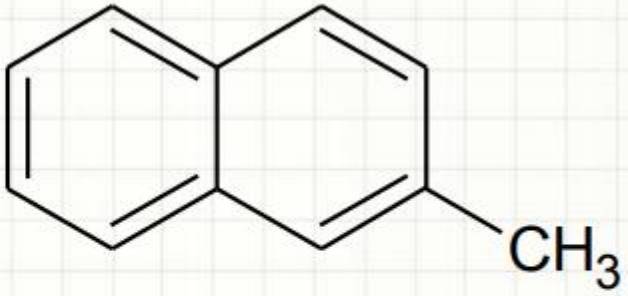
Hypochromic Effect

- When absorption intensity (ε) of a compound is decreased, it is known as hypochromic shift.



Naphthalene

ε = 19000



2-methyl naphthalene

ε = 10250