

UCB008 - APPLIED CHEMISTRY



Molecular Spectroscopy Series Lecture - VII

UV-Visible Spectroscopy – Colours in organic compounds

by

Prof. Ranjana Prakash

School of Chemistry and Biochemistry
Thapar Institute of Engineering and Technology
Patiala -147004, India

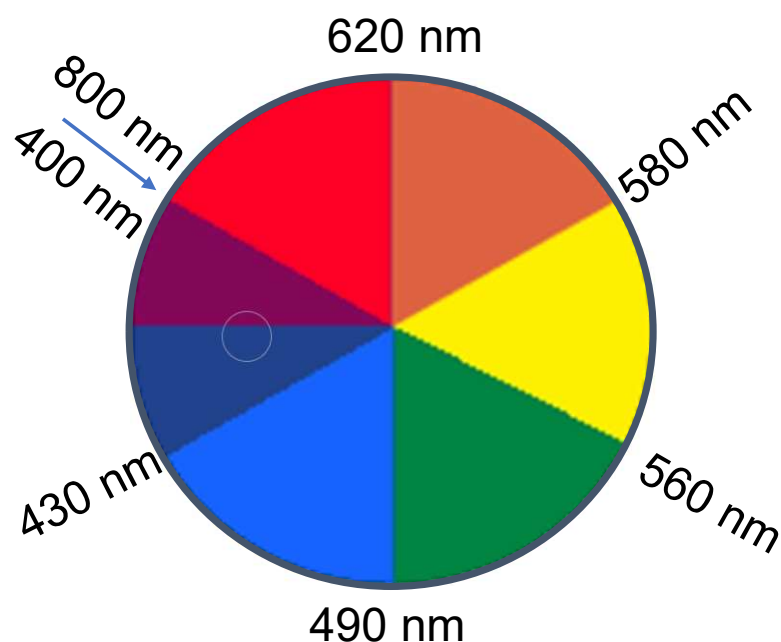
Learning Outcomes

At the end of this session participants should be able to:





















- Understand the origin of colours in organic compounds

Colour in organic compounds

- When white light passes through a coloured substance, a specific portion of the certain wavelengths is absorbed.



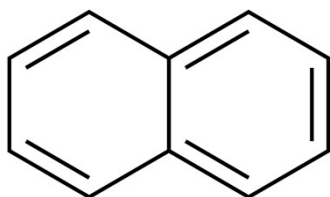
- The remaining portion of light acquires the complementary colour to the wavelength(s) absorbed.
 - Thus, absorption of 430-490 nm light gives orange colour to a substance, and absorption of 500-540 nm light makes it red.
 - Green colour will develop if the absorption at the start (400 nm) or end (800 nm) of the visible region.
- Complementary colours - diametrically opposite to each other.

Absorbed Light		Observed colour (transmitted)
Wavelength (nm)	Corresponding colour	
400	Violet 	 Yellow-green
425	Indigo-blue 	 Yellow
450	Blue 	 Orange
490	Blue-green 	 Red
510	Green 	 Purple
530	Yellow-green 	 Violet
550	Yellow 	 Indigo-blue
590	Orange 	 Blue
640	Red 	 Blue-green
730	Purple 	 Green

Pretsch, Clerc, Seibl, Simon: Spectral Structure Determination of Organic Compounds, Springer Science

Colour in organic compounds

Number of conjugated
double bonds



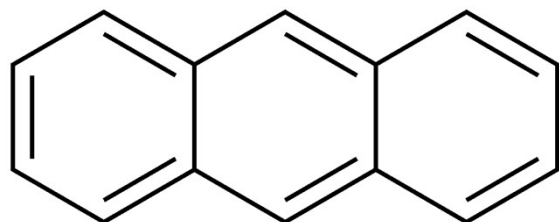
Naphthalene



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colourless



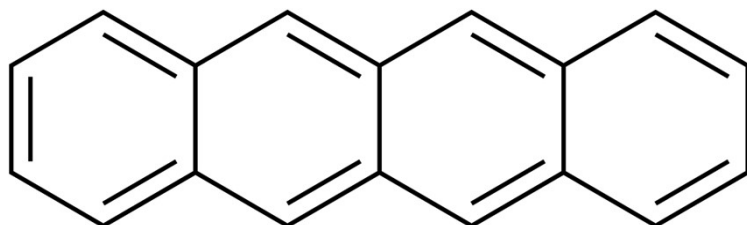
Anthracene



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colourless



Tetracene

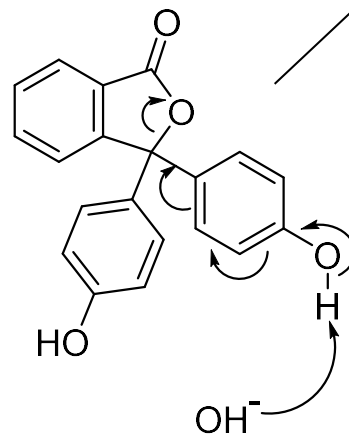
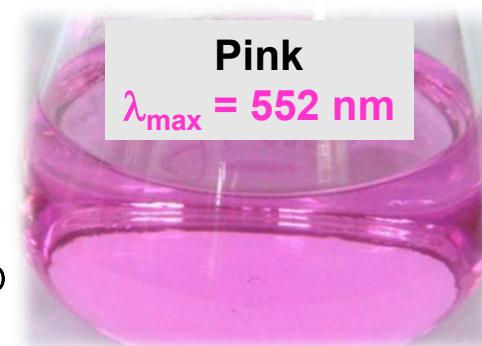
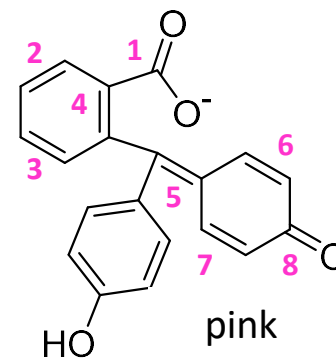
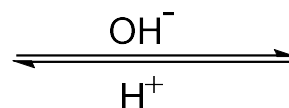
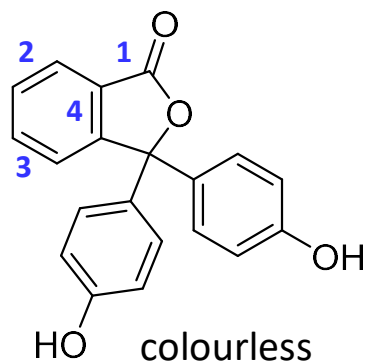


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orange

Colour in phenolphthalein



In the next session.....

- UV-visible spectroscopy – Instrumentation