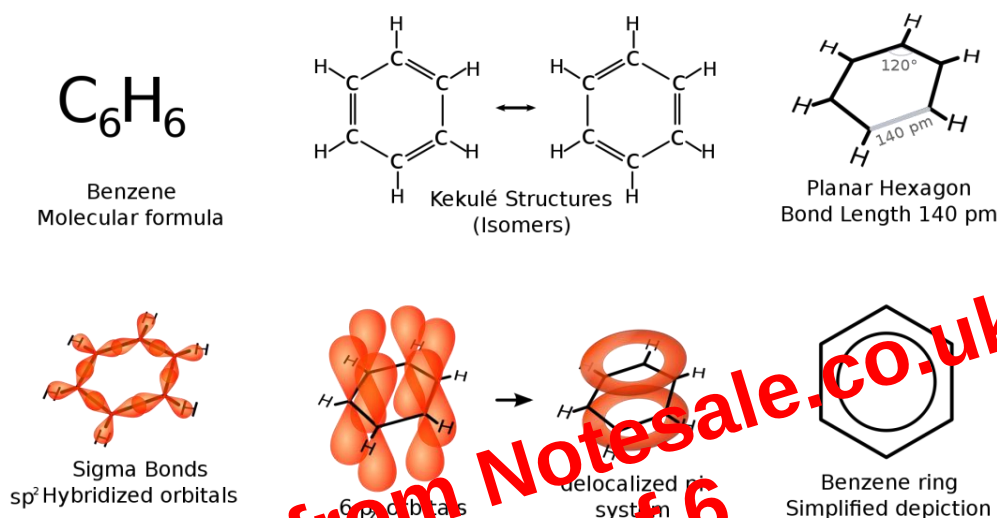


(Reflectance) White light is shone on the paint and the light reflected is measured for remaining wavelength of light. Different pigments absorb different wavelengths of light corresponding the energy gap between levels, therefore the reflectance spectrum for a pigment will be unique.

Recognise arenes and their derivatives (aromatic compounds)

An arene is an aromatic hydrocarbon – for example a benzene ring (C_6H_6)

Benzene, when displayed in the Kekulé structure, appears to have 3 unsaturated double bonds in a set place. In reality, the electrons are part of a delocalised electron system with the 6 carbon atoms contributing electrons to rings above and below to atoms.



There are 3 pieces of evidence which support this ringed structure and contradict Kekulé's structure:

- X-ray diffraction studies have produced electron density maps which show an even distribution of electrons around each carbon – Kekulé's structure would suggest electrons are more densely concentrated between the 3 double bonds
- The enthalpy change for the hydrogenation of benzene is much lower than would be expected of 3 double bonds – implying that benzene is more stable than Kekulé's structure suggests
- Bond lengths between the 'double bonds' in benzene are shorter than single bonds but longer than alkene double bonds – this suggests that benzene does not have 3 double and 3 single bonds, rather 6 different bonds entirely

Benzene, having regions of high electron density is often attacked by electrophiles. However rather than undergoing addition reactions, it often undergoes substitution reactions to keep the stable ring system intact.