

CHAPTER 13

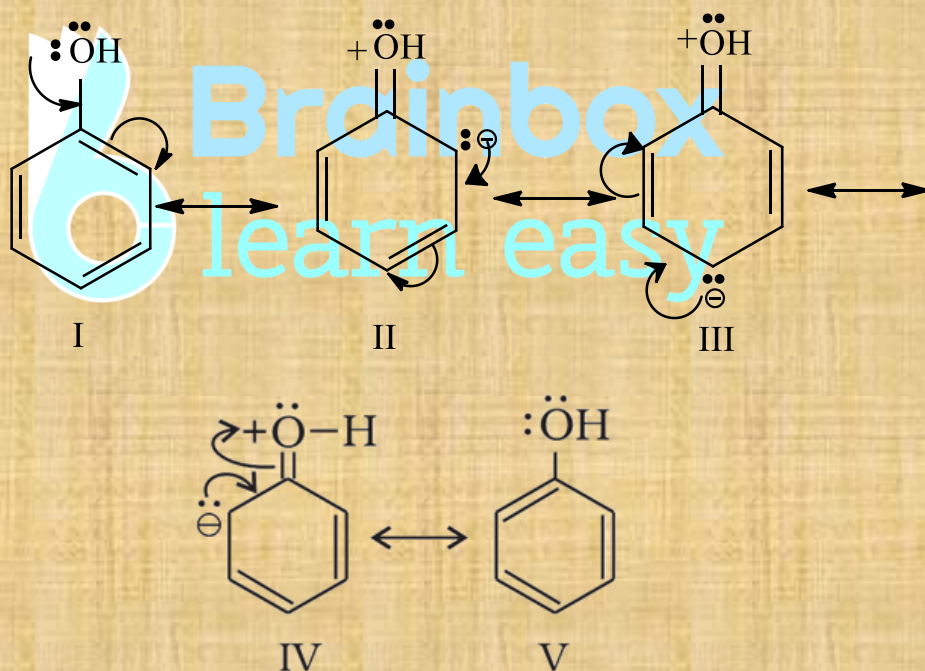
HYDROCARBONS

Directive influence:

- Substitution of a group on mono substituted benzene gives three different products, namely ortho, para and meta substituted products.
- Product obtained depends on directive influence of existing functional group.

Ortho & para directing groups:

The groups which increases electron density on ortho and para positions by inductive effect, mesomeric effect or hyper conjugation are called ortho, para directing group. These groups generally activates the ring and are electron donating groups.



Ex. $-\text{OH}$, $-\text{NH}_2$, $-\text{NHR}$, $-\text{NHCOCH}_3$, $-\text{OCH}_3$ etc.

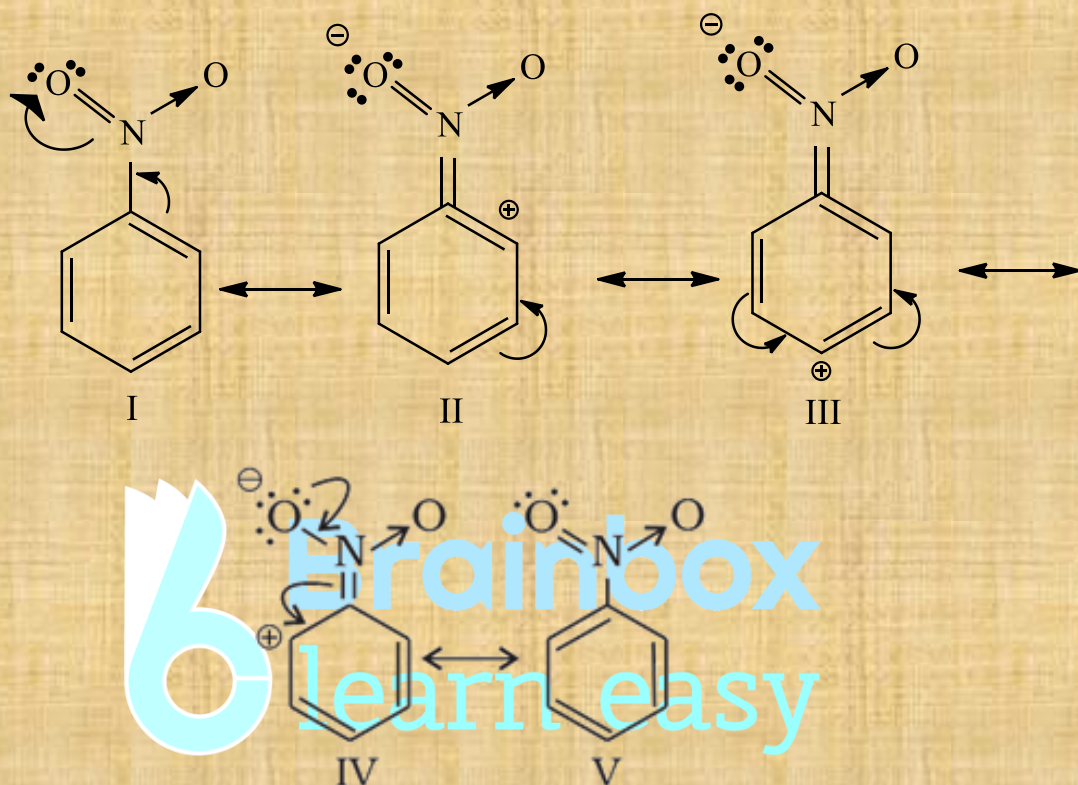
Meta directing groups:

The groups, which decreases electron density on ortho and para positions and direct the incoming group to meta position are called meta directing group.

These groups generally deactivates the benzene ring and are electron withdrawing groups.

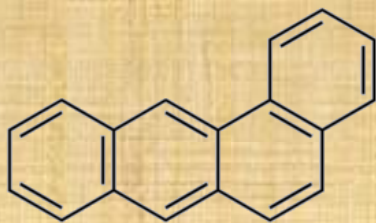
Ex. $-\text{NO}_2$, $-\text{CN}$, $-\text{CHO}$, COR etc.

Halogens are deactivating but ortho and para directing groups.

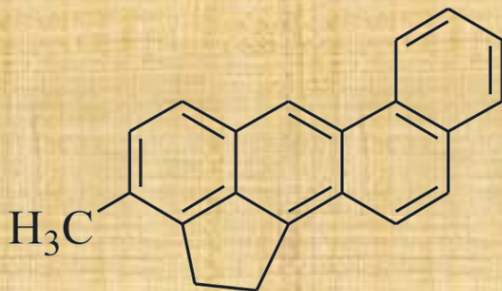


Carcinogenicity and Toxicity:

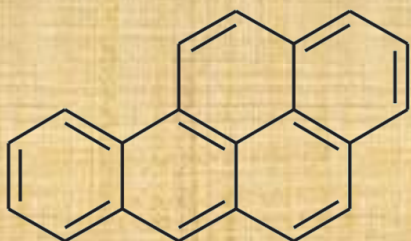
- Benzene and polycyclic aromatic hydrocarbons with more than two benzene rings fused are carcinogenic in nature.



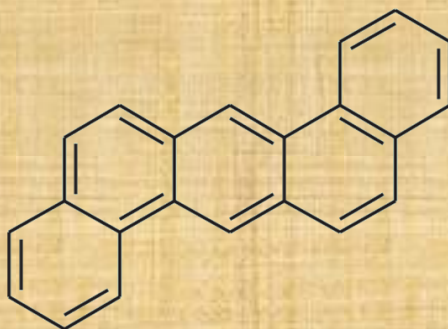
1, 2 - Benzanthracene



3 - Methylcholanthrene



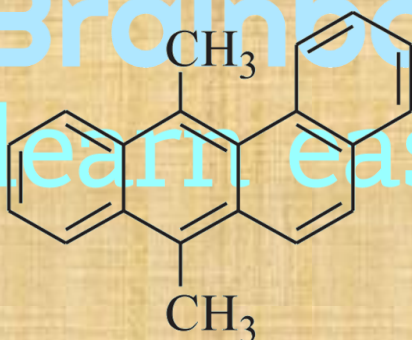
1, 2 - Benzpyrene



1,2,5,6 - Dibenzanthracene



Brainbox
learn easy



9,10 - Dimethyl - 1, 2 - benzanthracene

- They are formed due to incomplete combustion of organic material such as tobacco, coal and petroleum.
- They can alter DNA and cause cancer.