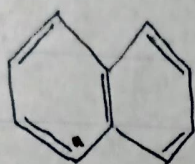
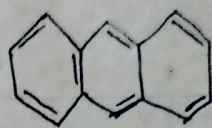


Fused Polynuclear aromatic Hydrocarbons

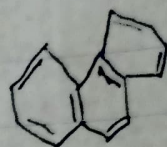
Fused or Condensed aromatic hydrocarbons contains more than one ring and have two carbons shared by two (or three) aromatic rings. The most important members of this class are naphthalene, and anthracene.



Naphthalene



Anthracene



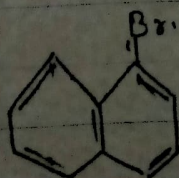
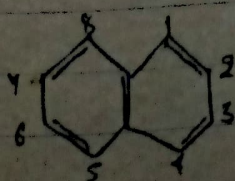
Phenanthrene

Naphthalene [NAPHTHALENE]

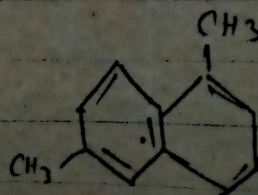
Naphthalene is the largest single constituent of coal tar. It is obtained by chilling the middle oil fraction (b.p. $170-225^{\circ}\text{C}$). When crude naphthalene crystallises out, it is purified by washing successively with dilute sulphuric acid (to remove basic impurities) and sodium hydroxide (to remove acid impurities) and water. Finally the solid is sublimed or steam distilled to give pure naphthalene.

Nomenclature of naphthalene derivatives $\rightarrow$

In naming derivatives of naphthalene, the numbering system shown below is used. The numbers selected to denote the position of a substituent on the naphthalene ring should be as small as possible.

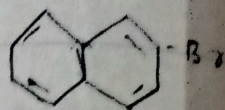
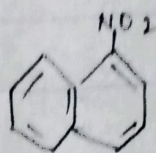
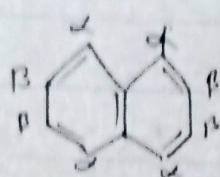


1-Bromo naphthalene.



1,6-dimethyl naphthalene.

An alternative nomenclature system is occasionally used when there is only one substituent on the naphthalene skeleton. This system uses Greek letters α (alpha) and β (beta) to designate the two possible orientations of the single substituent.

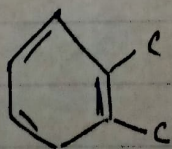


α -nitro naphthalene, β -nitro naphthalene

Structure of naphthalene

(i) Classical Structure $\rightarrow$

- (i) Elemental analysis and molecular weight determinations shows that molecular formula of naphthalene is $C_{10}H_8$.
- (ii) Dipole moment of naphthalene is zero. This indicates that naphthalene molecule is symmetrical.
- (iii) Oxidation - Naphthalene with Oxygen and V_2O_5 at $470^\circ C$ yields Phthalic anhydride. This indicates the presence of a benzene ring with two ortho side chains in the molecule.



- (iv) Nitration of naphthalene produces a nitro naphthalene which oxidation yields 3-nitrophthalic acid. The presence of Nitro group stabilises the benzene ring to which it is attached (ring B).