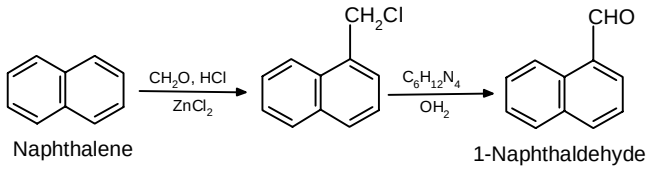
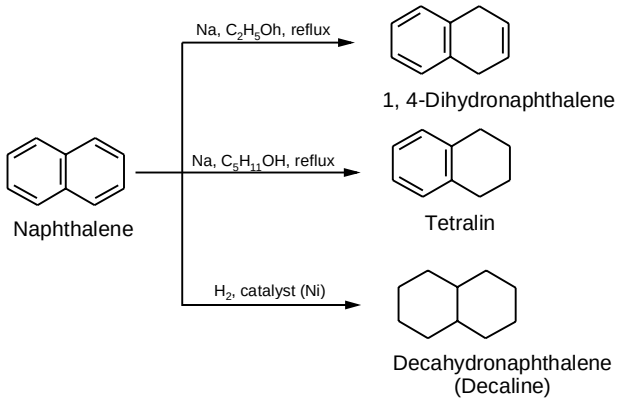
(*e*) *Chloromethylation*: Chloromethylation, i.e., introduction of a CH_2Cl group takes place easily and subsequent treatment with hexamethylenetetramine ($CH_2O + NH_3$) yields an aldehyde.

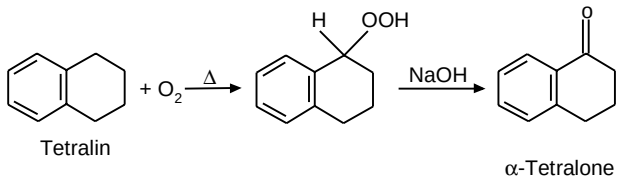


Reduction

Different reducing agents reduce naphthalene to varying degrees.

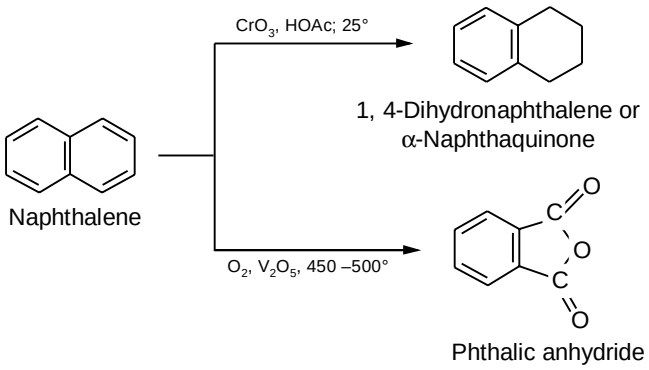
Heating tetraline in air for 50 hours at 70° and decomposing the peroxide so formed with sodium hydroxide yields α-tetralone.





Oxidation

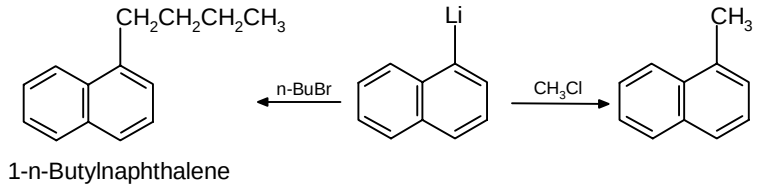
Oxidation of naphthalene by different oxidizing agents produces different products. Under milder conditions, 1, 4-naphthaquinone is obtained while vigorous oxidation yields phthalic anhydride. In the latter oxidation, phthalic acid is initially formed which loses water immediately to give phthalic anhydride.

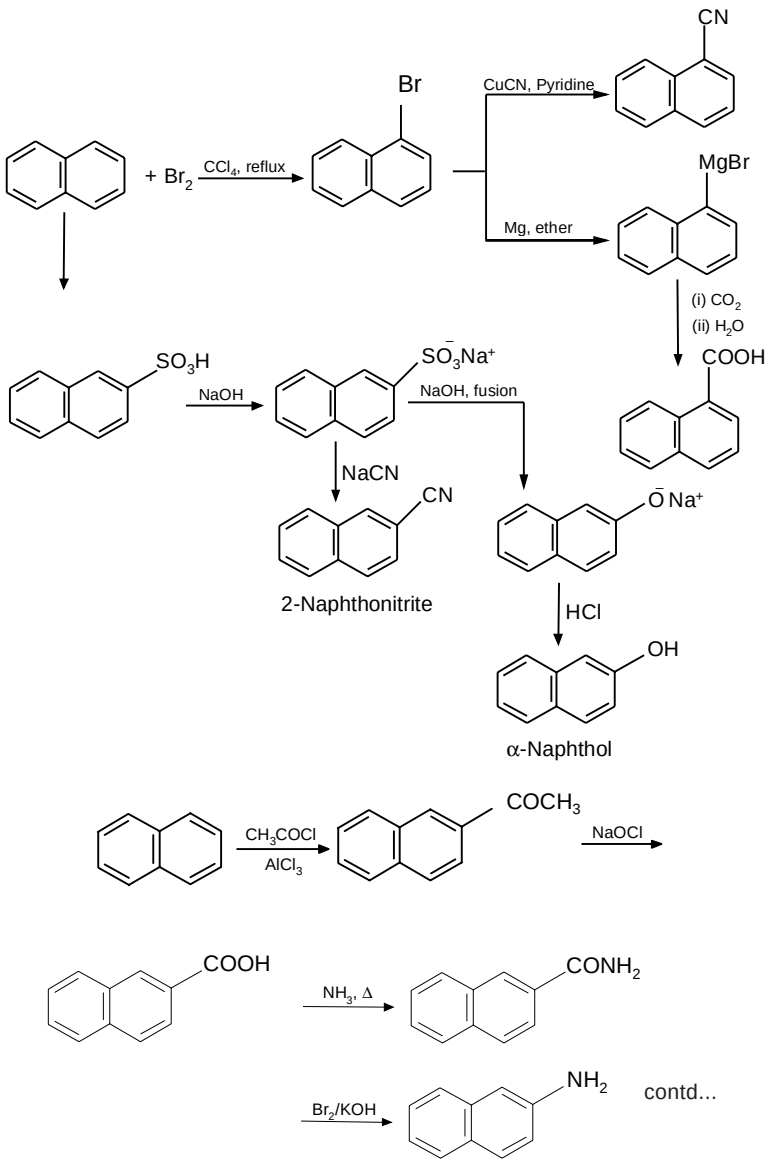


Oxidation of certain naphthalene derivatives such as 2-methylnaphthalene destroys the aromatic character of one ring and instead forms a diketo compound.

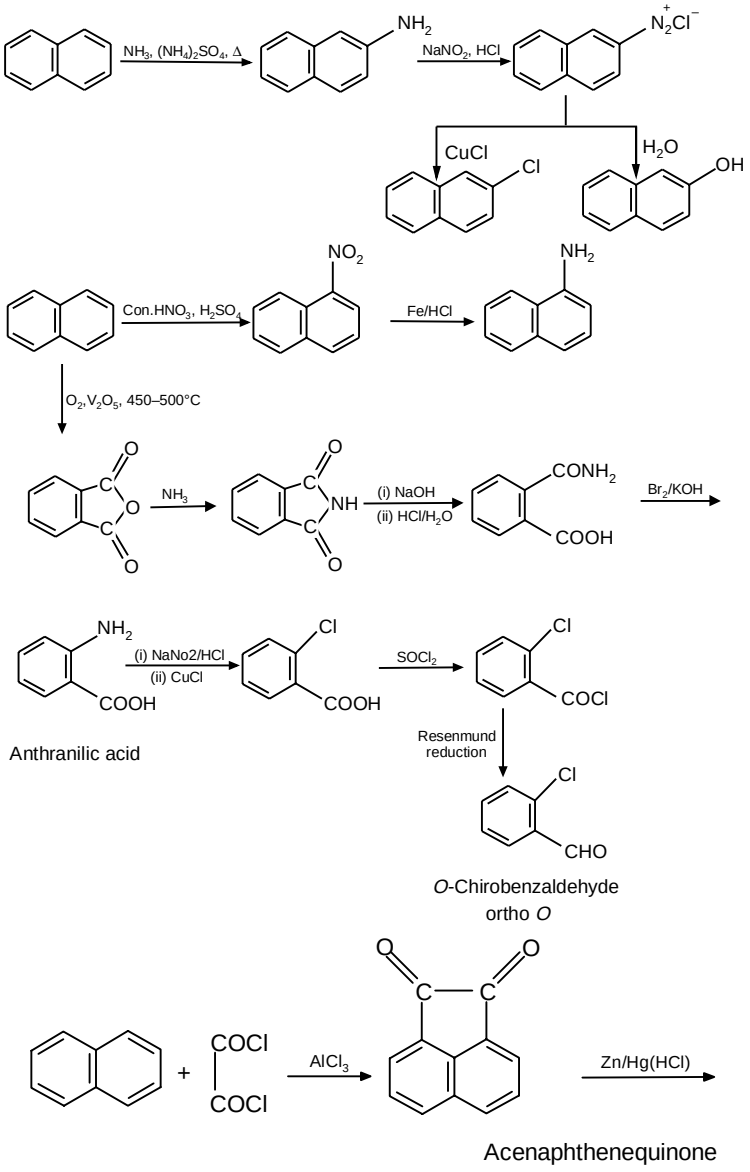
Naphthalene Derivatives

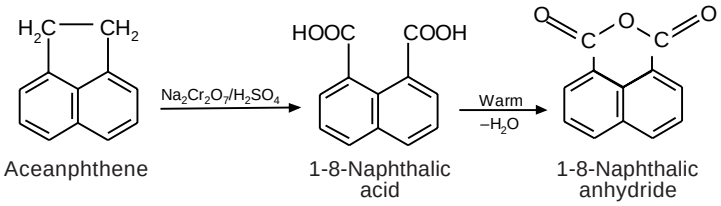
The different α-and β-substituted derivatives of naphthalene can be prepared by the following sequence of reactions.



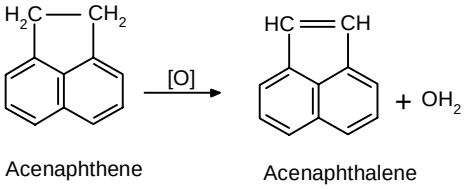

CN
Br
CuCN, Pyridine
+ Br2
CCl4, reflux
MgBr
Mg, ether
(i) CO2
(ii) H2O
COOH
SO3H
NaOH
SO3⁻Na+
NaOH, fusion
NaCN
CN
O⁻Na+
2-Naphthonitrite
HCl
OH
α-Naphthol
COCH3
CH3COCl
AlCl3
NaOCl
COOH
NH3, Δ
CONH2
Br2/KOH
NH2

contd...


NH3, (NH4)2SO4, Δ
NH2
NaNO2, HCl
N2Cl
CuCl
Cl
H2O
OH
Con.HNO3, H2SO4
NO2
Fe/HCl
NH2
O2,V2O5, 450–500°C
NH3
(i) NaOH
(ii) HCl/H2O
CONH2
COOH
Br2/KOH
(i) NaNo2/HCl
(ii) CuCl
SOCl2
COCl
Resenmund reduction
CHO
Anthranilic acid
O-Chirobenzaldehyde
ortho O
AlCl3
Zn/Hg(HCl)
Acenaphthenequinone

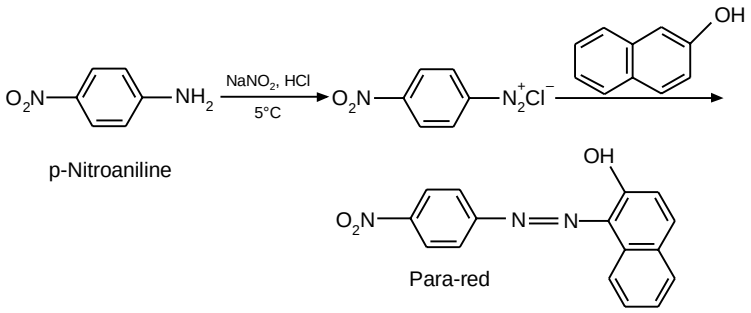


Acenaphthene on oxidation with lead peroxide yields acenaphthalene.



Preparation of Dyes

Para-red dyes is obtained from β-nitroaniline and b-naphthol. The coupling takes place at the 1-position.



1-Methyl-2-natphthol does not couple with p-nitroaniline under ordinary conditions. This supports the view that there is much more double bond character between, 1, 2 positions than the 1, 3-positions. Another important point is that substitution at position-3 will result in a high energty o-quinone system. This conclusion is substantiated by the bromination of 2-methylnaphthalene which occurs at the 1-and not the 3-position.