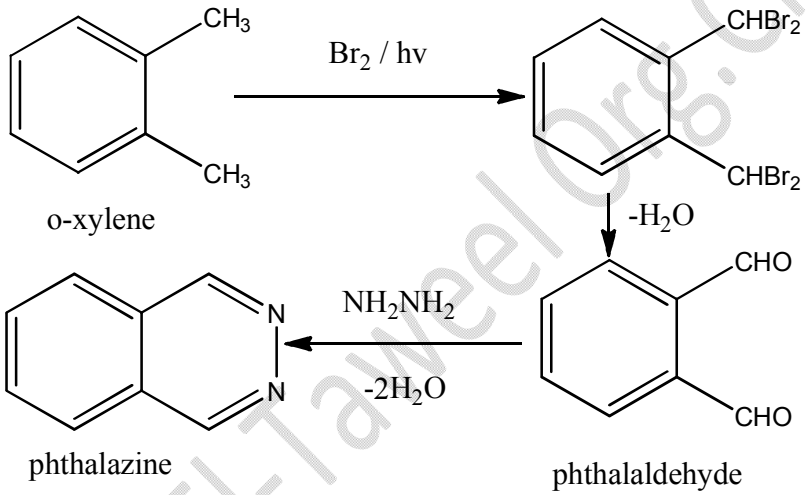
3)Phthalazine

A-Methods of preparation :

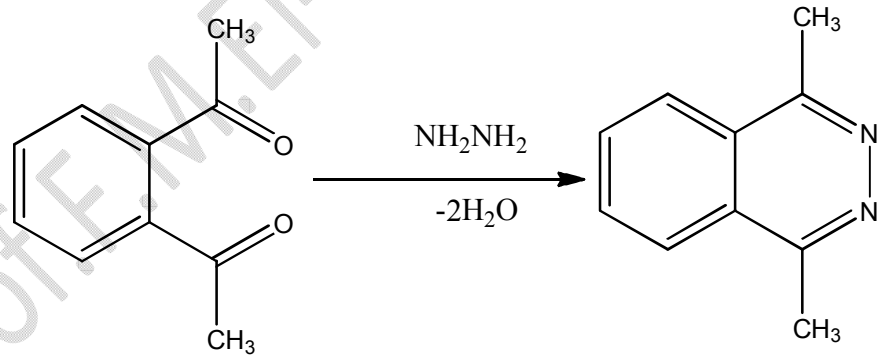
1-By ondensation of hydrazines with o-dialdehydes,o-diesters,o-diacylbenzenes (o-diformylbenzene,o-diacetylbenzene ,o-dibenzoylbenzene) and phthalimide derivatives.



o-xylene

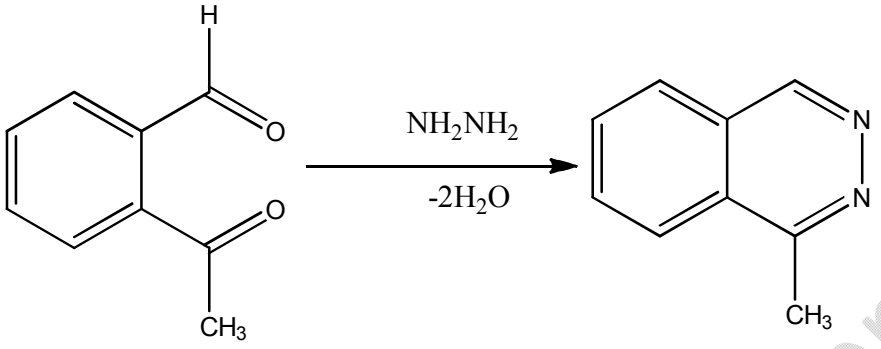
phthalazine

phthalaldehyde

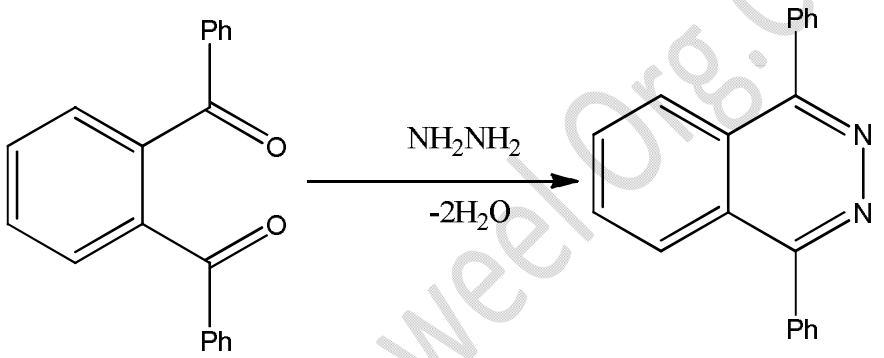


1,2-diacetylbenzene

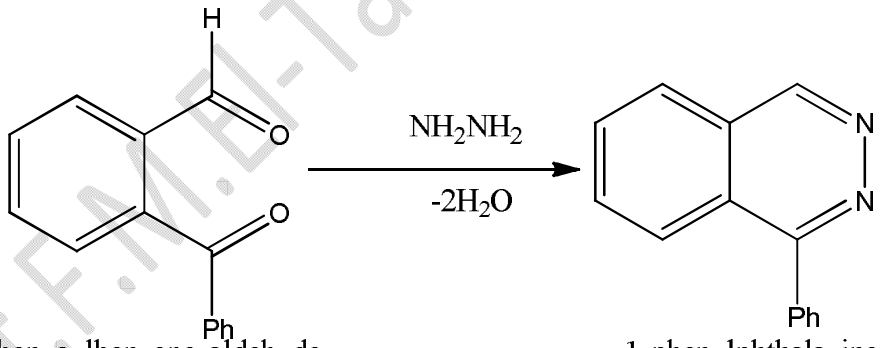
1,4-dimethylphthalazine



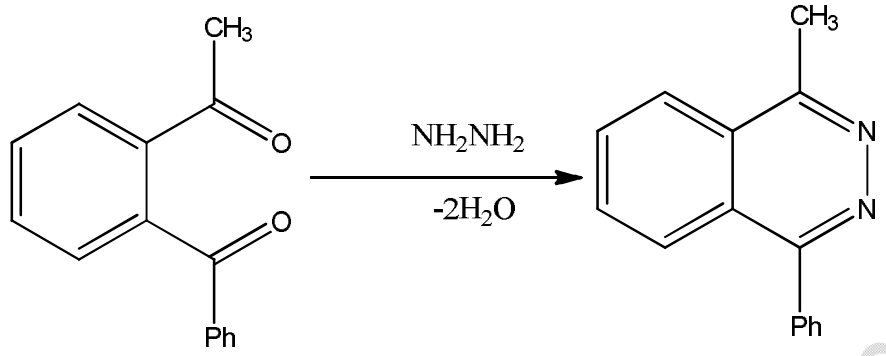
2-acetylbenzenezaldehyde 1-methylphthalazine



1,2-dibenzoylbenzene 1,4-diphenylphthalazine

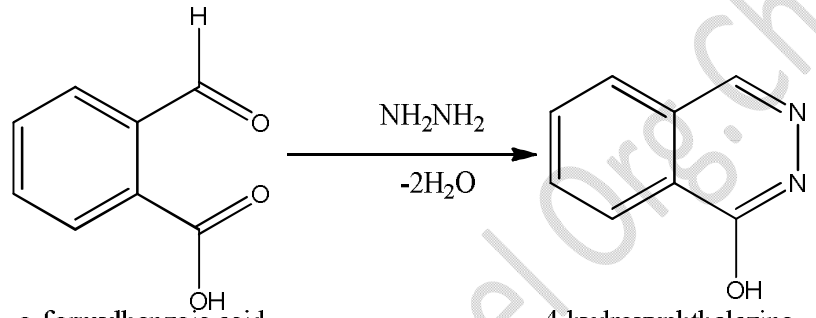


1-benzoylbenzenezaldehyde 1-phenylphthalazine



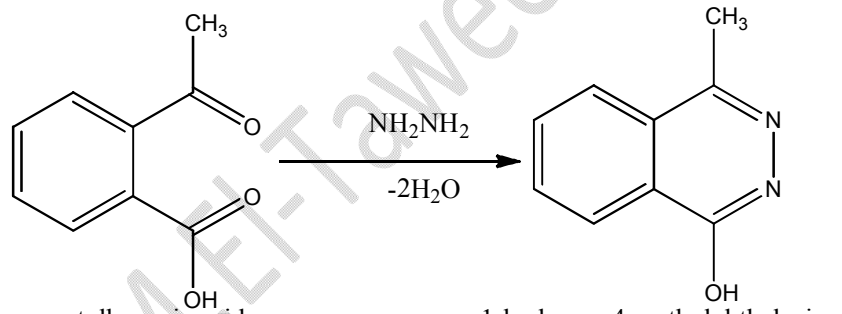
1-acetyl-2-benzoylbenzene

1-methyl-4-phenylphthalazine



o-formylbenzoic acid

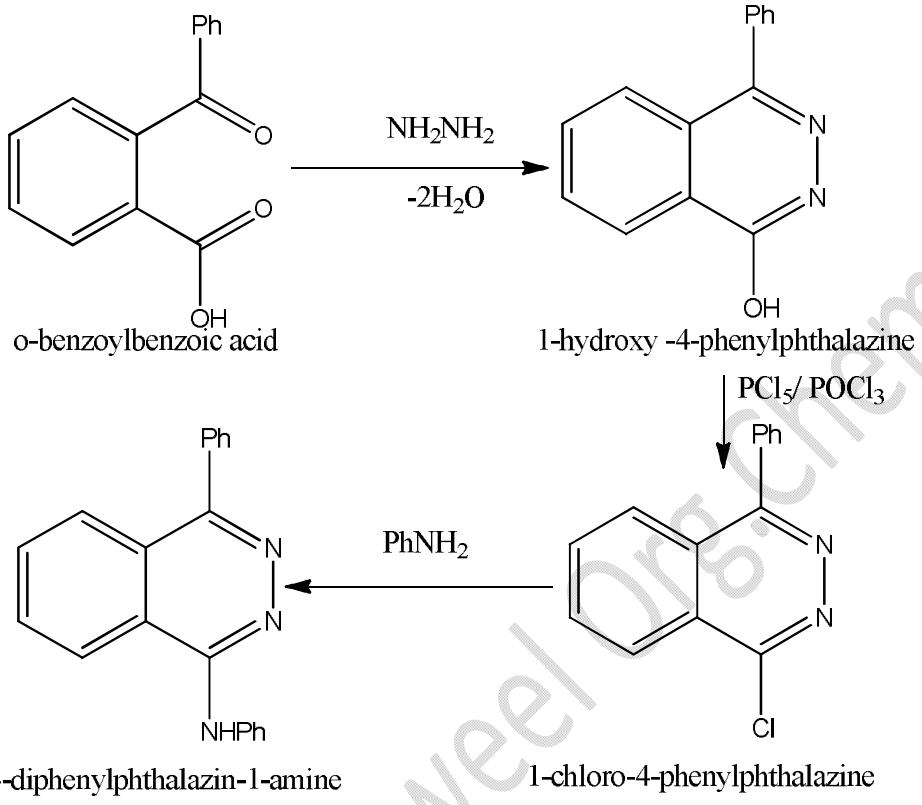
4-hydroxyphthalazine



o-acetylbenzoic acid

1-hydroxy- 4-methylphthalazine

(4-methylphthalazin-1-ol)

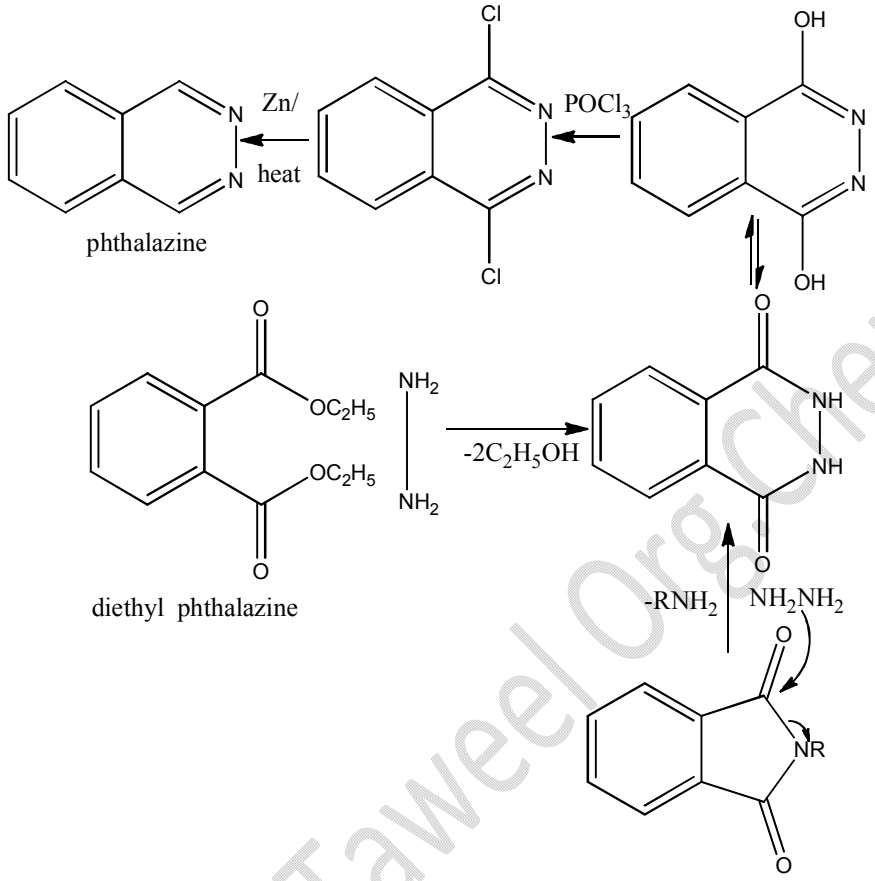


o-benzoylbenzoic acid

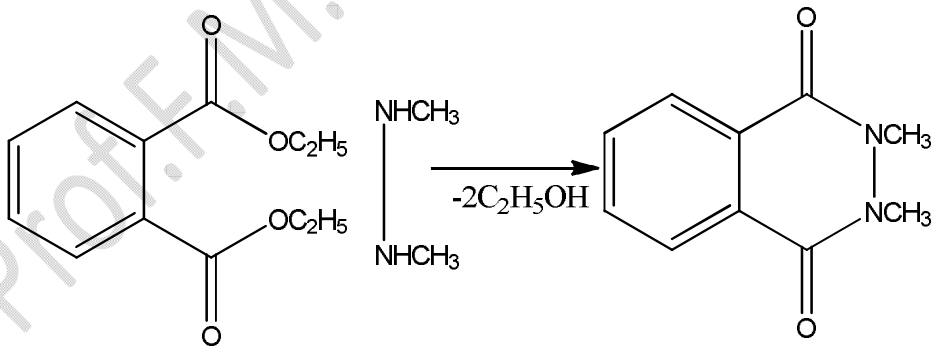
1-hydroxy -4-phenylphthalazine

1-chloro-4-phenylphthalazine

N,4-diphenylphthalazin-1-amine

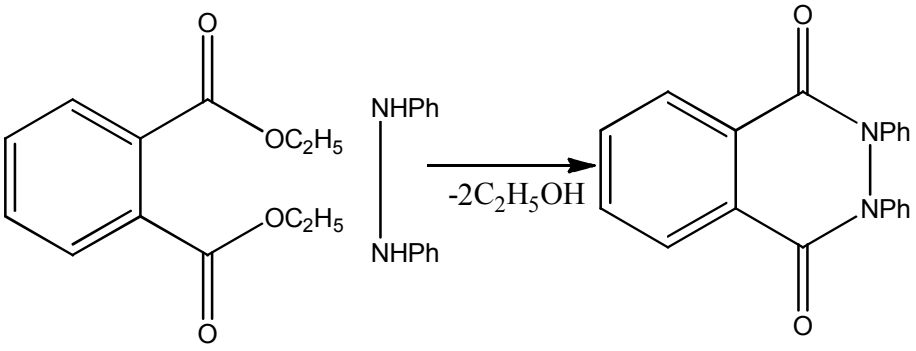


By condensation of 1,2-dimethylhydrazine or 1,2-diphenylhydrazine with diethyl phthalate

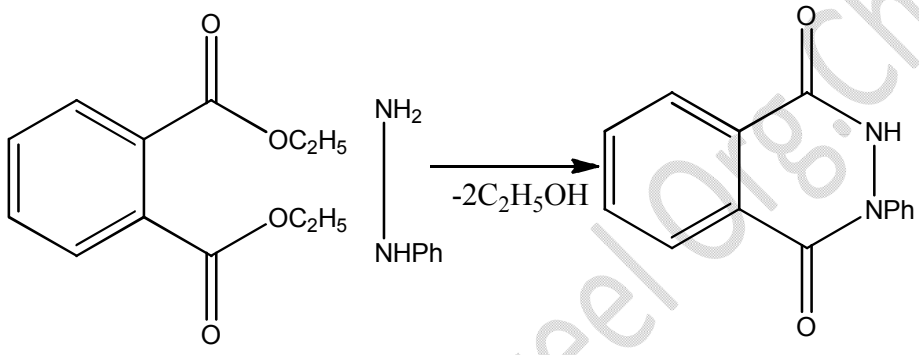


diethyl phthalate

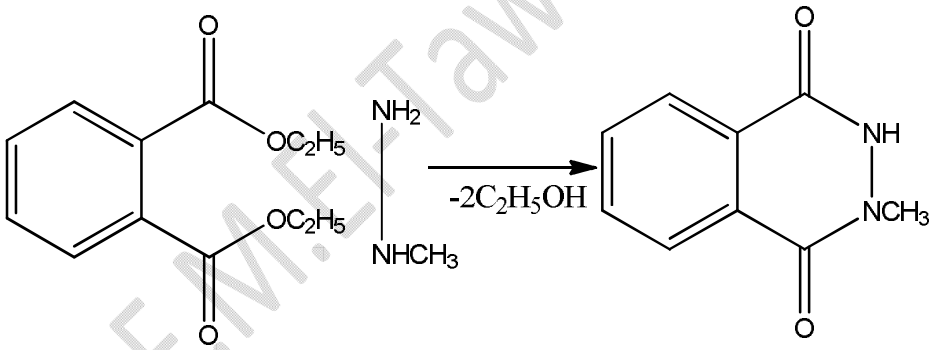
2,3-dimethyl-2,3-dihydrophthalazine-1,4-dione



diethyl phthalate 2,3-diphenyl-2,3-dihydrophthalazine-1,4-dione



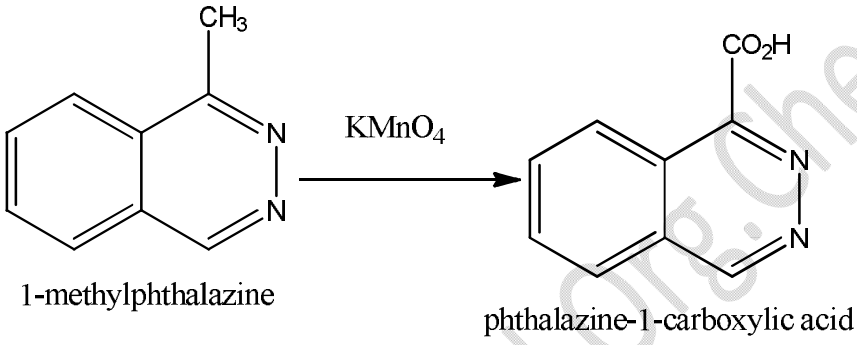
diethyl phthalate 2-phenyl-2,3-dihydrophthalazine-1,4-dione



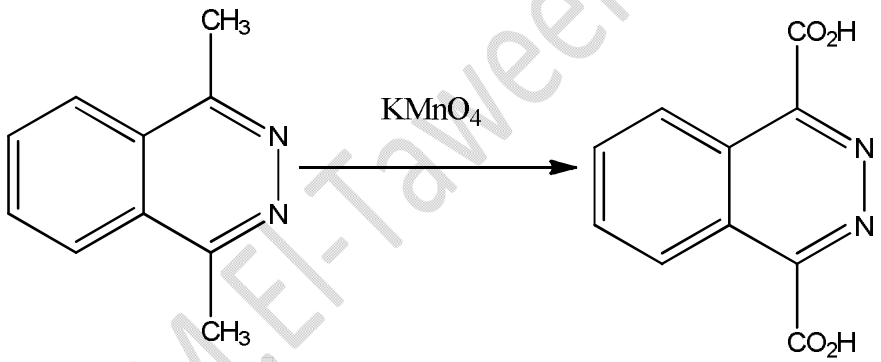
diethyl phthalate 2-methyl-2,3-dihydrophthalazine-1,4-dione

Reactivity of the methyl groups at C-1 and C-4 positions :

Methyl groups in the 1-and 4-positions are readily condense with aromatic aldehydes and other carbonyl compounds .They can also oxidized with oxidizing agents such as $KMnO_4$ and SeO_2.



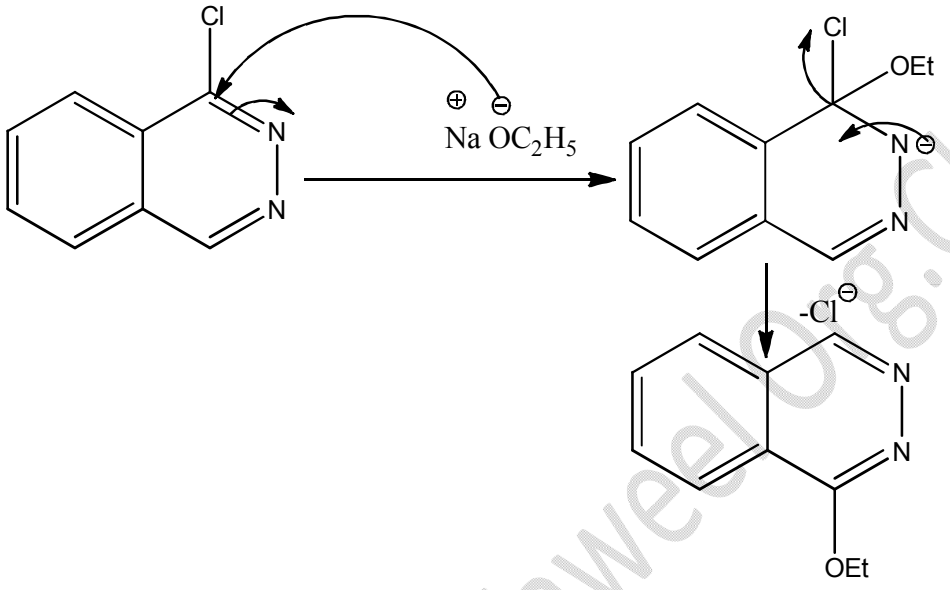
1-methylphthalazine phthalazine-1-carboxylic acid



1,4-dimethylphthalazine phthalazine-1,4-dicarboxylic acid

Nucleophilic substitution reactions:

The effect of the second ring nitrogen atom is demonstrated by a comparison of the rates of reaction of 1-chlorophthalazine and 1-chlorouinoline with ethoxide ions at 20^{o}C,the rates are about 3000 to isoquinoline.



1-ethoxyphthalazine