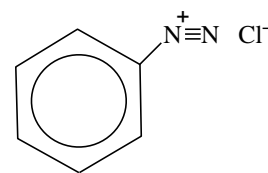


BENZENE DIAZONIUM CHLORIDE

Structure

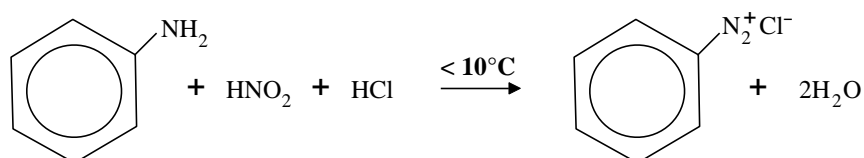
- has the formula $C_6H_5N_2^+ Cl^-$
- a diazonium group is attached to the benzene ring
- the aromatic ring helps stabilise the ion



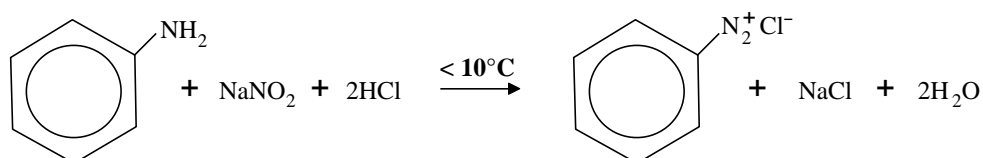
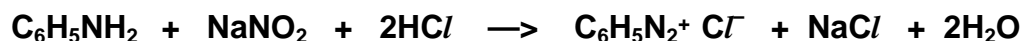
Preparation From phenylamine (which can be made by reduction of nitrobenzene)

reagents nitrous acid* and hydrochloric acid

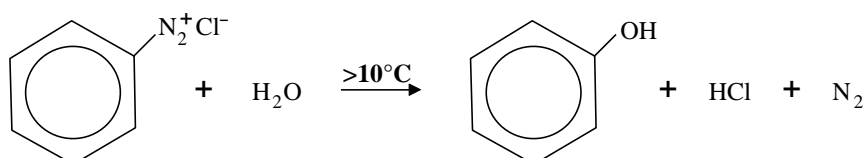
conditions keep below $10^\circ C$



* **notes** nitrous acid is unstable and is made *in situ* from sodium nitrite



the solution is kept cold to slow down decomposition of the diazonium salt



Reactions

Benzene diazonium chloride undergoes two main types of reaction

- **SUBSTITUTION OF THE DIAZONIUM GROUP** *nitrogen expelled*
- **COUPLING REACTIONS** *nitrogen atoms retained*

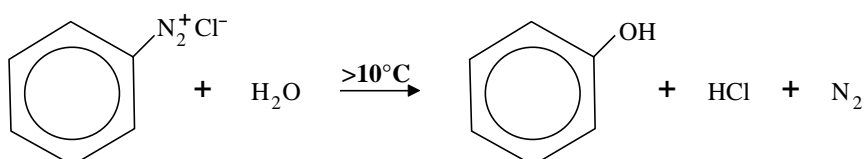
SUBSTITUTION

OH

reagents
conditions
equation

water (**hydrolysis**)

warm above 10°C



use

- the only reasonably simple way to substitute OH
- phenol is an antiseptic and is used to make polymers

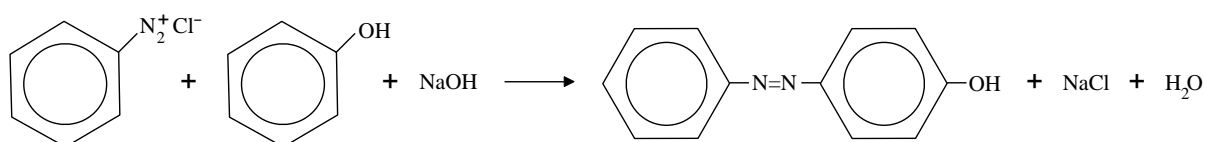
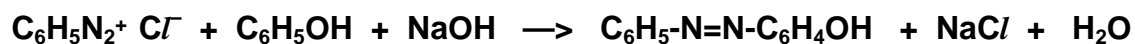
COUPLING

Phenols

reagents
conditions
equation

phenol and sodium hydroxide

alkaline solution below 10°C



(4-hydroxyphenyl)azobenzene

YELLOW

use

making azo dyes

the **-N=N-** is the AZO functional group

Q.1 Outline a scheme, listing reagents and conditions, for the synthesis of 1,3-diiodobenzene. (n.b. iodine directs to the 2,4, and 6 positions)