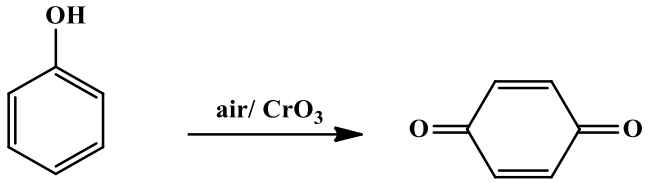
12. Oxidation:

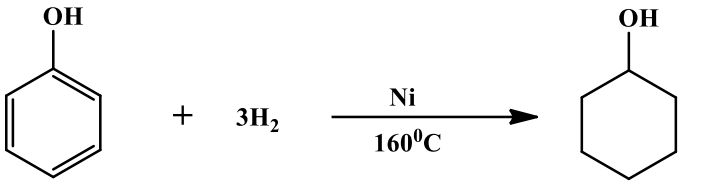
Phenol undergo oxidation with air/ CrO_3 (chromic acid) to form para-benzoquinone.



Phenol **_p_-Benzoquinone**

13. Catalytic hydrogenation / Reduction:

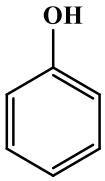
Phenol on catalytic hydrogenation/ reduction gives cyclohexanol. A mixture of its vapour and hydrogen is passed over nickel catalyst at 160ºC.



Phenol **Hydrogen** **Cyclohexanol**

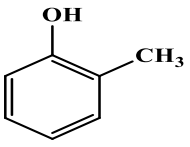
Structure and Uses

1. Phenol

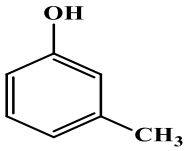


- Phenol is used as disinfectant (in low concentration).
- Phenol has been used as first surgical antiseptic.
- As starting material for plastics.
- As ingredient for explosives like picric acid.
- To synthesize drugs.
- Used to make intensely coloured dyes.
- Also used as preservatives.
- Phenol spray is used medically to help sore throats.
- Active ingredient in some oral analgesics.
- Used in study and extraction of biomolecules.
- Used in cosmetic industry.

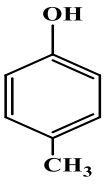
2. Cresols



***o*-Cresol**



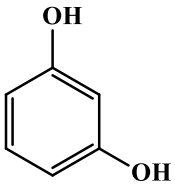
***m*-Cresol**



***p*-Cresol**

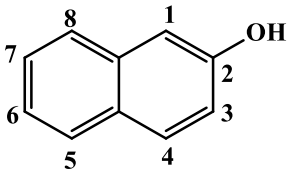
- Strong germicides.
- Effective disinfectant.
- Antiseptics.
- Important component of creosote (a wood preservative).
- *m*- Cresol is used in making photographic developer and explosives.
- *p*- Cresol can be converted to butylated hydroxyl toluene (as antioxidant).

3. Resorcinol

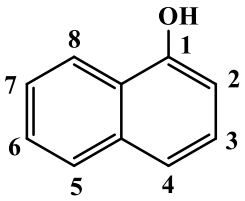


- Used to treat acne, eczema, psoriasis and other skin disorders.
- Also used to treat corns, calluses and warts.
- Treat pain and itching caused by minor cuts and scrapes, burns, insect bites, poison ivy, sunburn or other skin irritations.

4. Naphthols



β- Naphthol or 2- Naphthol



α- Naphthol or 1- Naphthol

- Naphthol dissolved in ethanol (Molisch test) is used for detecting presence of carbohydrates.
- 1-naphthol with sodium hypobromite (Sakaguchi test) to detect presence of arginine.
- Decreases testosterone level in adult men.

QUALITATIVE TEST

1. Aqueous solution of phenol + 1-2 drops of $FeCl_3$ → Violet colour.
2. Aqueous solution of phenol + Br_2 water → White precipitate of 2,4,6-tribromophenol.
3. Liebermann nitroso reaction.
4. Nitrosoamine + Phenol + conc. H_2SO_4 → Green solution → (OH^-) → Blue