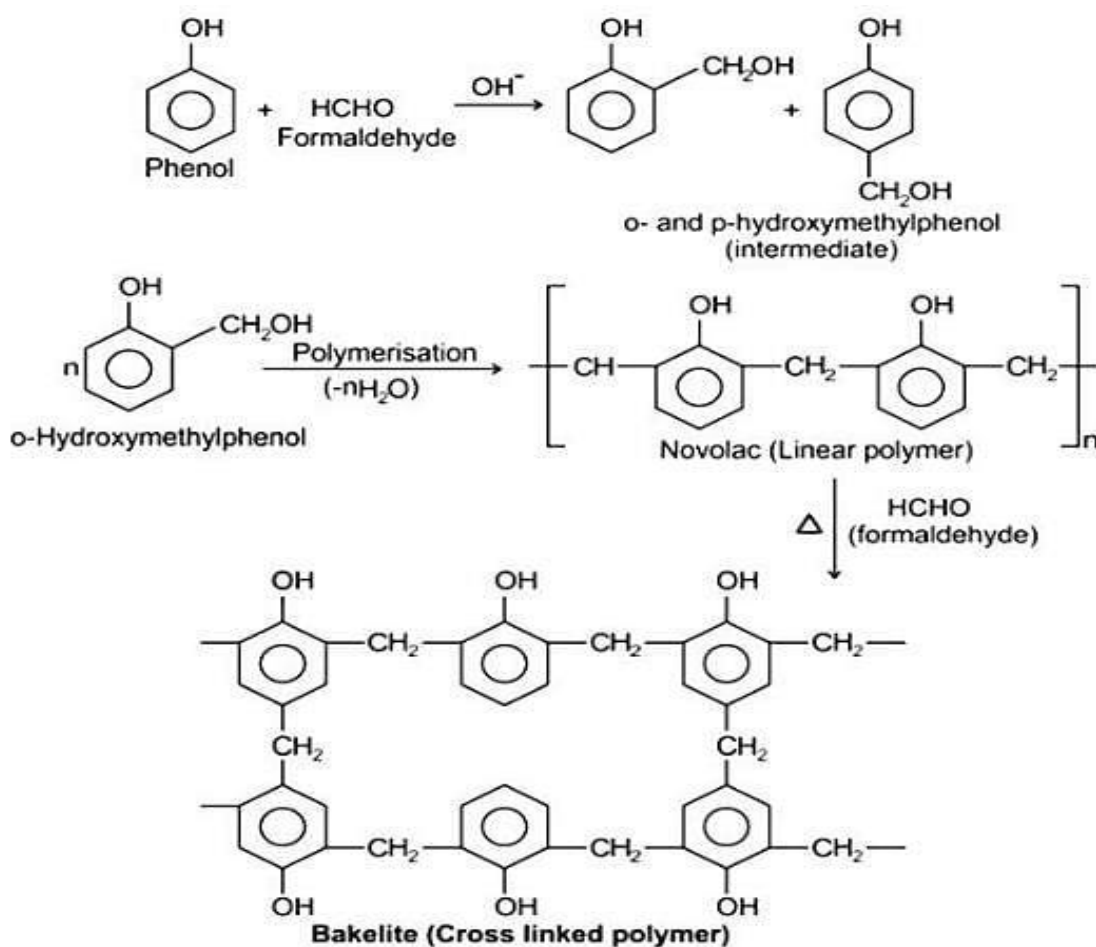




## Bakelite

### Preparation :

The most important of this class is bakelite or phenol-formaldehyde resin. It is prepared by condensing phenol with formaldehyde in presence of acid-alkaline catalyst in an aqueous solution. In presence of acid catalyst, the first step leads to the formation of o- and p-hydroxy methyl phenol, which forms linear polymer.





In the second step a small amount of hexamethylene tetramine added and at the steam temperature, the chain length increases and also three-dimensional resin is formed, which crosslinks the structure. Thus, the soluble novolac gets converted to insoluble bakelite.

### **Properties:**

- . These phenolic resins are rigid, hard, water resistant.
- They are resistant to non-oxidising acids, organic solvents but are susceptible to alkalis. Solubilities and melting point of the resin gradually change with rise of molecular weight.
- These resins possess electrical insulating properties.

### **Applications**

- It can be widely used as metal substitute where high tensile strength is not necessary.
- As an inert material it can substitute for glass. It can be used for making insulator parts like switches, plugs, heater handles.
- It can be moulded to cabinets for TVs and radio and telephone parts.
- It is used as adhesive also used in paints and varnishes, as cation exchanger resin for water softening, in paper industry as propeller shafts.