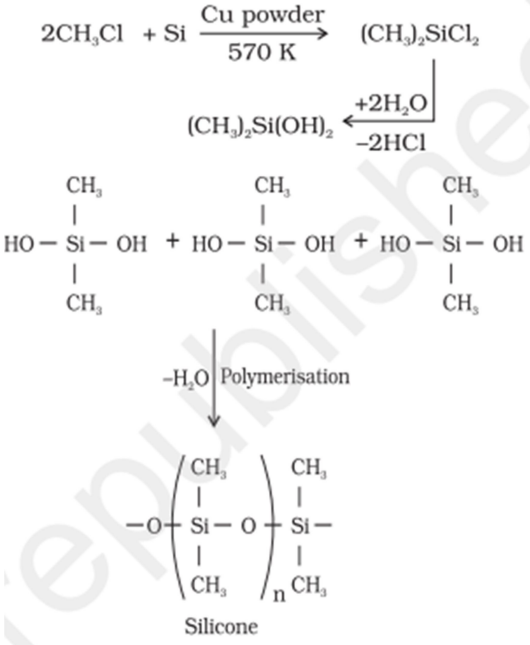
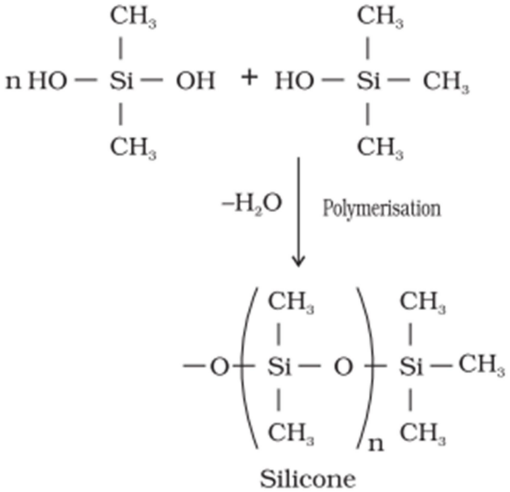
substituted chlorosilane of formula $MeSiCl_3$, Me_2SiCl_2, Me_3SiCl with small amount of Me_4Si are formed. Hydrolysis of dimethyldichlorosilane, $(CH_3)_2SiCl_2$ followed by condensation polymerisation yields straight chain polymers.



Silicone

The chain length of the polymer can be controlled by adding $(CH_3)_3SiCl$ which blocks the ends as shown below :



Silicone

11.8.4 Silicones

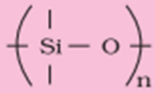
They are a group of organosilicon polymers, which have (R_2SiO) as a repeating unit. The starting materials for the manufacture of silicones are alkyl or aryl substituted silicon chlorides, $R_nSiCl_{(4-n)}$, where R is alkyl or aryl group. When methyl chloride reacts with silicon in the presence of copper as a catalyst at a temperature 573K various types of methyl

Silicones being surrounded by non-polar alkyl groups are water repelling in nature. They have in general high thermal stability, high dielectric strength and resistance to oxidation and chemicals. They have wide applications. They are used as sealant, greases, electrical insulators and for water proofing of fabrics. Being biocompatible they are also used in surgical and cosmetic plants.

Problem: 11.8

What are silicones ?

Solution

Simple silicones consist of  chains in which alkyl or phenyl groups occupy the remaining bonding positions on each silicon. They are hydrophobic (water repellant) in nature.