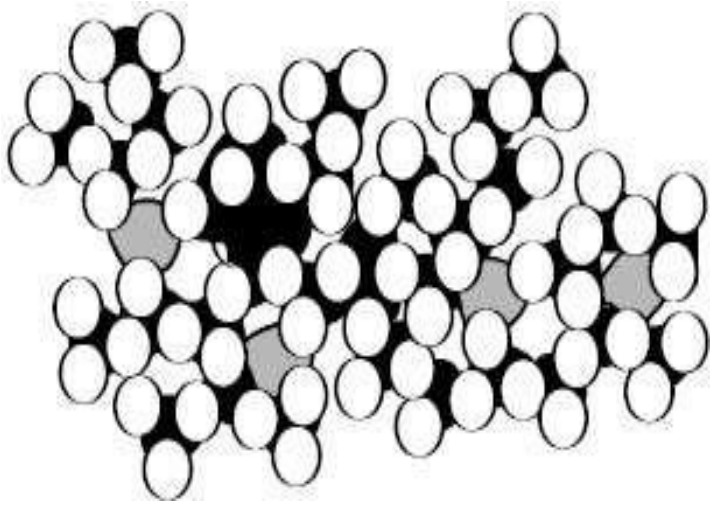
Classification On The Basis Of Chemical Constituents

- According to this classification method inorganic polymers are classified on the basis of parameters as following:

1. wholly inorganic polymers
2. inorganic-organic polymers
3. organometallic polymers
4. hybrid organic-inorganic polymers

wholly inorganic polymers

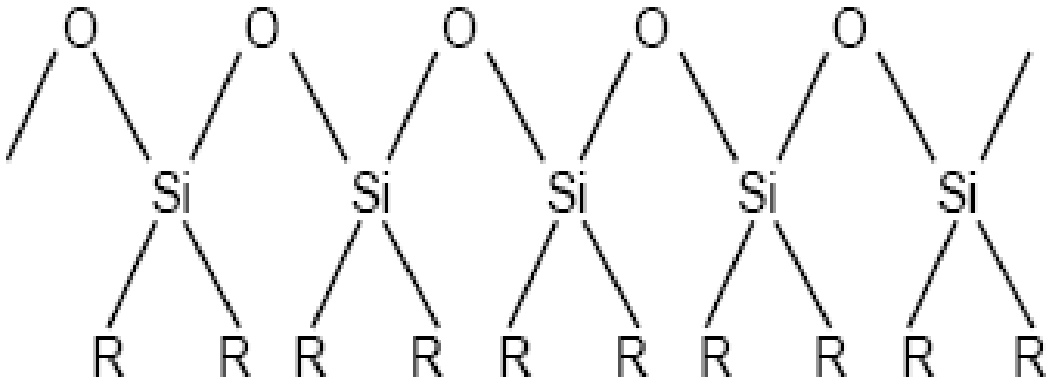
- Inorganic polymers in this class constitute the major components of soil, mountains and sand, and they are also employed as abrasives and cutting materials (diamond, silicon carbide (carborundum), fibres (fibrous glass, asbestos, boron fibres), coatings, flame retardants, building and construction materials (window glass, stone, Portland cement, brick and tiles), and lubricants and catalysts (zinc oxide, nickel oxide, carbon black, silica gel, aluminium silicate, and clays).

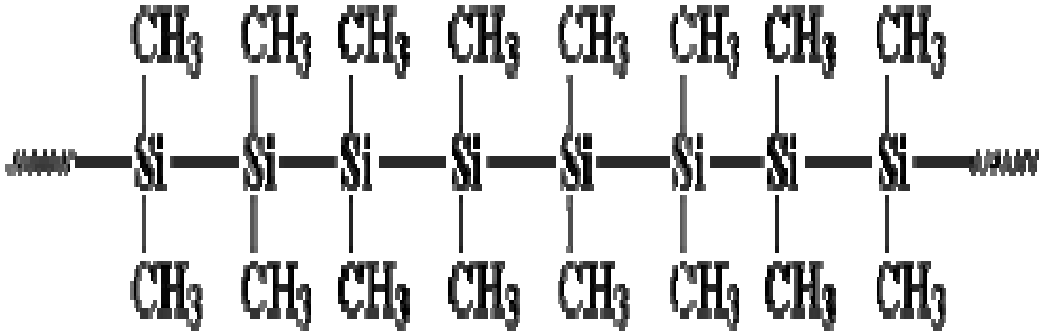


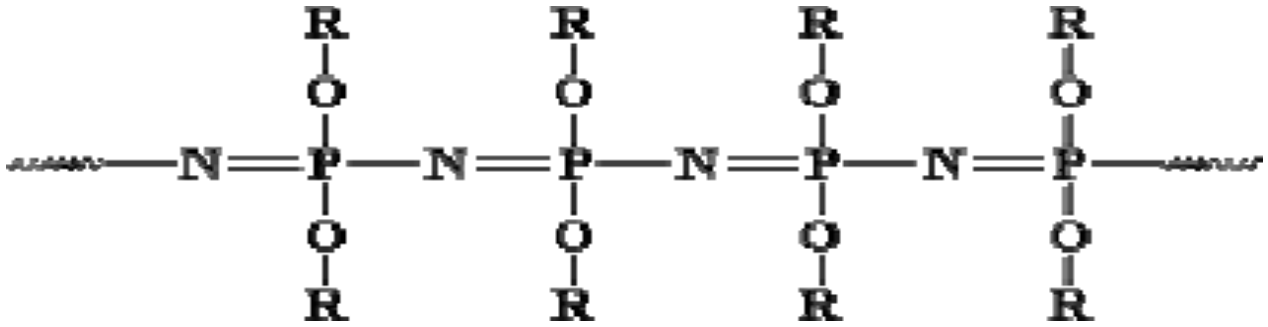
Structure of a typical silicon dioxide intensive glass

Inorganic-organic Polymers

- Inorganic polymers containing organic portions attached to inorganic elements in their backbone. The area of inorganic-organic polymers is very extensive. Some examples of this class are: polysilanes, polysiloxanes, polyphosphazenes.

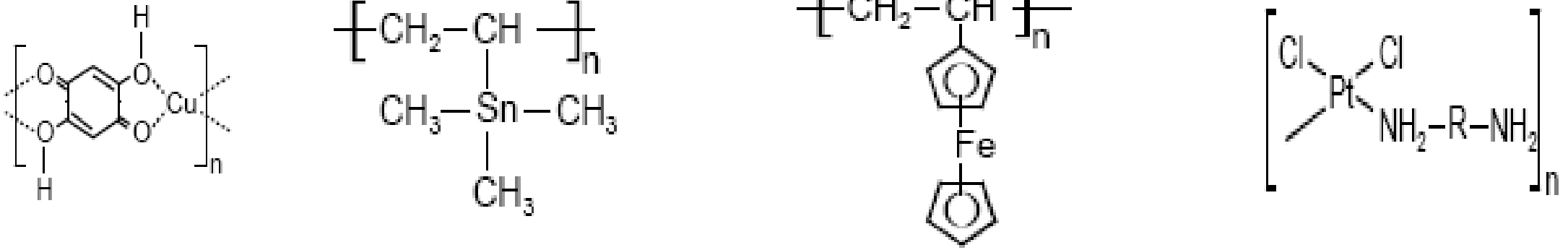






Organometallic Polymers

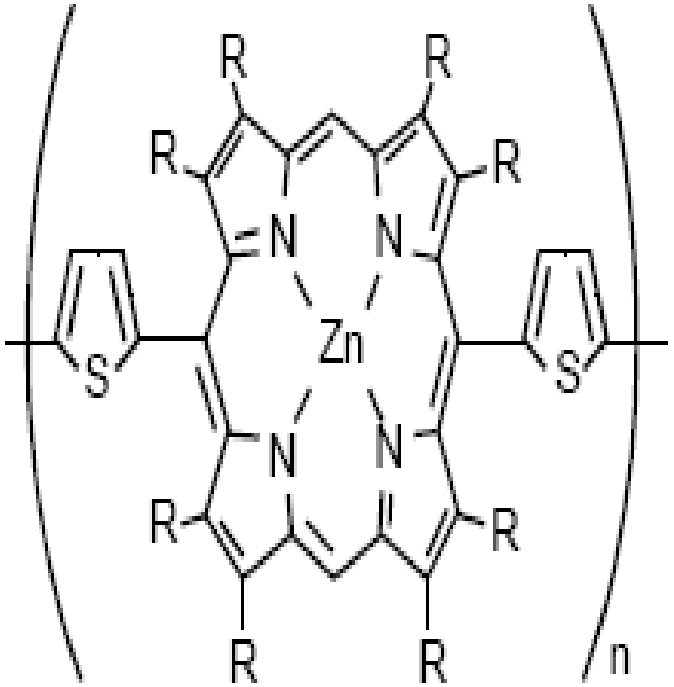
- Organometallic polymers are made of over 40 elements including main group of metals (si or ge), transition metals or rare earth elements in addition to the 10 elements (C, H, N, O, B, P, halides) which is found in organic polymers. The variations of organometallic polymers seem endless.
- Organometallic polymers are new materials which combine the low density and structural variations and functional group varieties of organic materials with electrical conductivity and the high temperature stability features of inorganic compounds.



Different structures found in organometallic polymers

Hybrid organic-inorganic polymers

- Hybrid organic-inorganic networks, prepared via sol-gel process, are multi- functional materials offering a wide range of interesting properties. Since there are countless different combinations of the organic and inorganic moieties, a large number of applications are possible by incorporation of inorganic building blocks such as silica networks, porous materials and metals.



Π-conjugated polymers prepared via organometallic condensation reactions