

Assignment - 1

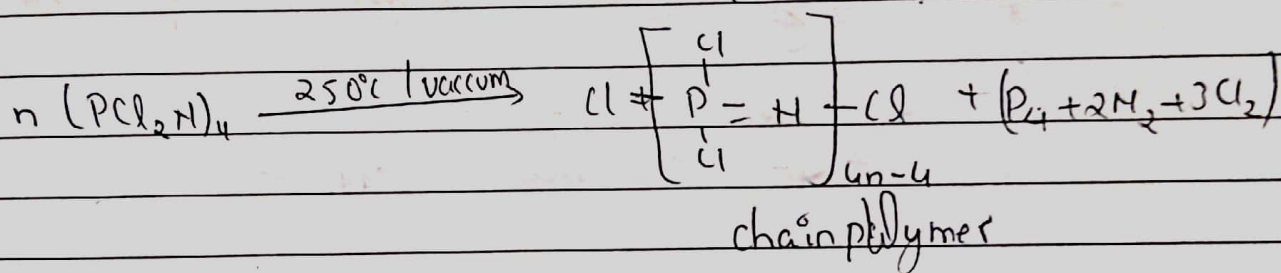
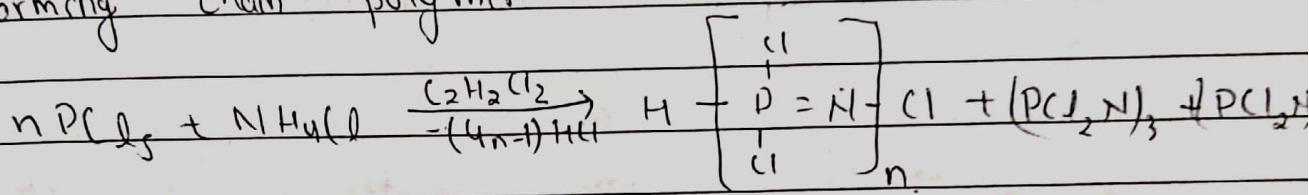
Inorganic Polymers

classmate
Date _____
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1) Explain the preparation & use of polyphosphazenes, & polymeric sulfur nitride.

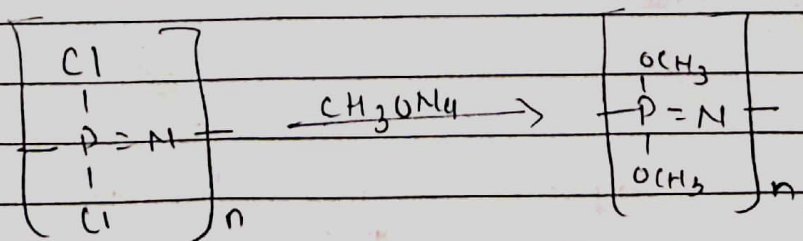
⇒ a) Polyphosphazene chlorides.

⇒ They are prepared by reaction betⁿ phosphorus pentachloride & ammonium chloride in presence of $\text{C}_2\text{H}_5\text{Cl}$ at $120^\circ - 150^\circ\text{C}$ followed by heating cyclic tetramer in vacuum at 250°C forming chain polymer.

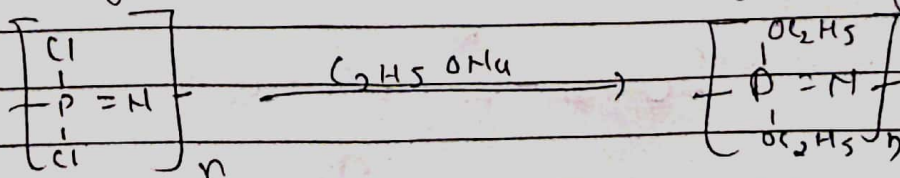


b) Polydimethoxy phosphazenes & polydiethoxy phosphazene

⇒ They are prepared by the reacting of phosphazene chloride with sodium methoxide (CH_3ONa) & sodium ethoxide ($\text{C}_2\text{H}_5\text{ONa}$) respectively.



polyphosphazene chloride polydimethoxy phosphazene



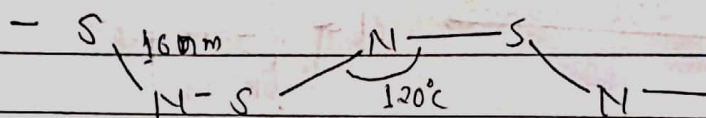
polyphosphonite chloride polydiethoxy phosphazene

Uses

- Uses.
- They are used for making transparent & film forming thermopolymers
 - They are used for preparation of thermopolymers.

Polymeric sulphur nitride $(SN)_n$.

It is nearly planner chain of SM bands of approximately identical length nearly 16nm .

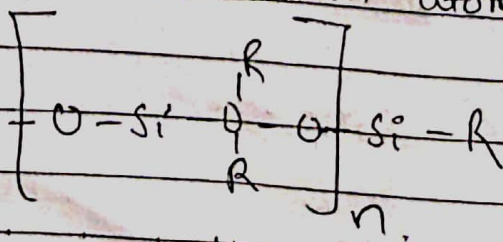


→ It is used for the construction of the digital circuits digital computer, transformer, electric motor etc.

2) klinte short note:

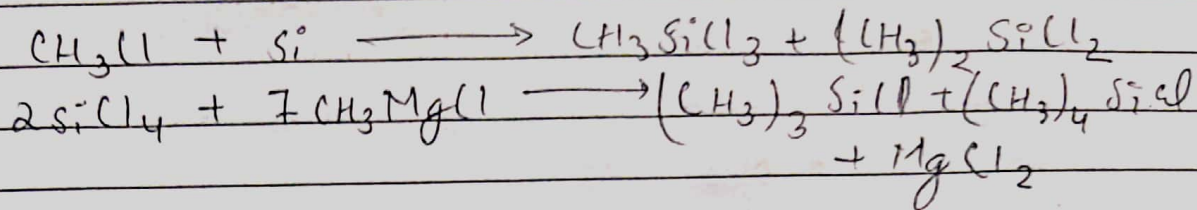
a) Silicones

It is an organic polymer which contains alternate silicon, oxygen linkage. Organic radical are attached with silicon atom.



Where, $R =$ alkyl or phenyl radical

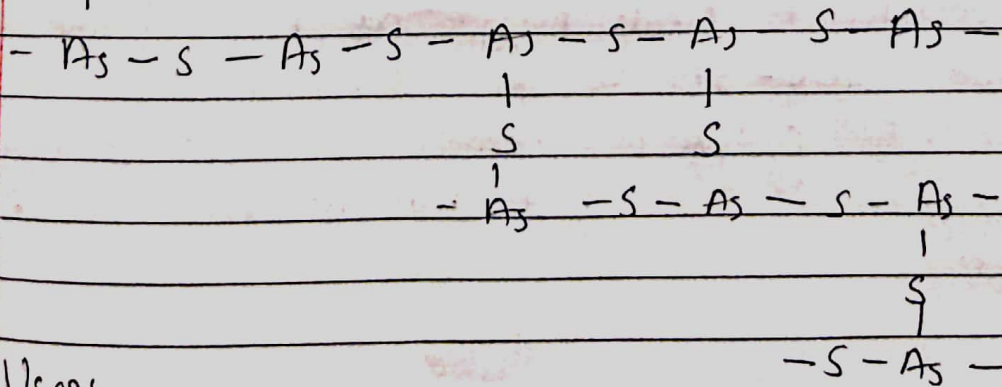
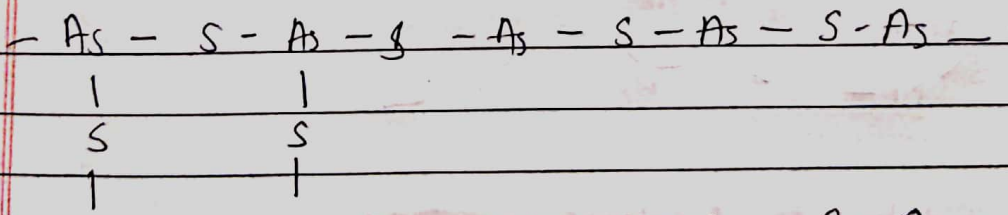
They are prepared by the action of silicon with alkyl halide or silicon halide with Grignard reagent.



b) Chalcoenide glasses.

They are cross-linked amorphous polymers prepared by the quenching of chalcogenite compounds with one or more of the polyvalent elements like As, Ge, In, P etc.

It is a compounds containing elements like Si, Se, Te etc. As_2S_3 is the best known chalcogenide containing two elements.



Uses

- Memory device of computers.
- Electroluminescent displays.
- Ultrasonic delay lines.

3) What are inorganic polymers? Given an account of chalcogenides glass & polythiazyl.

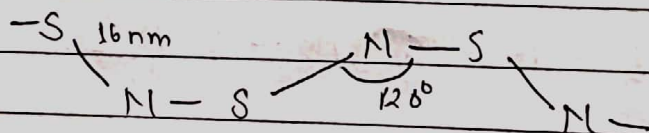
★ Inorganic polymers are macromolecules formed by the combination of atoms other than carbon in main chain or backbone. Elements like Si, P, N, S etc.



Silicone.

Polythiazyl (Polymeric Sulphur nitride) (SM)_n.

It is nearly planar chain of S-N bonds of approx. identical length nearly 16nm.



Its electrical conductivity at room temperature is about $1200 - 3700 \Omega^{-1}cm^{-1}$, lowering the temp. to 4.2K. At 0.26K it becomes a superconductor. This polymer is the first non-metallic superconductor.

Q) What do you mean by inorganic polymers?
Mention the application of silicones in engineering field.

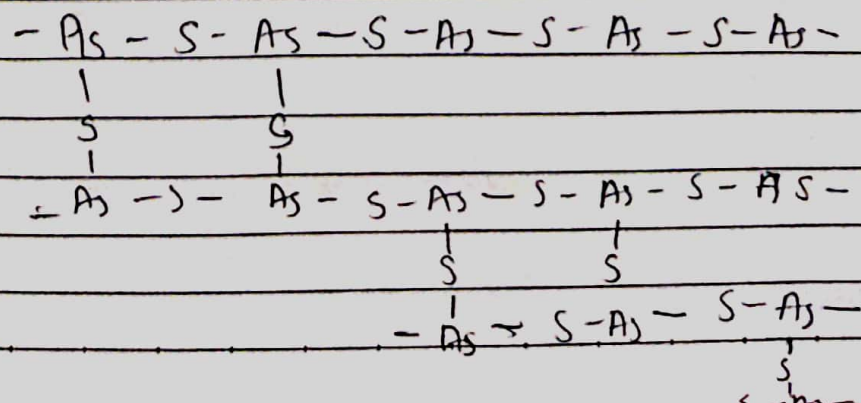
⇒ Inorganic polymers are macromolecule formed by the combination of atoms other than carbon in main chain or back bone. Elements like Si, P, Al, S, etc.

Application of silicones in engineering field :-

- They are used as sealing material in seal lights & in aircraft engines.
- For manufacture of tyres for fighter aircrafts.
- As adhesive in electronics industry.
- For making artificial heart valves transfusion tubing & padding for plastic surgery.

Q) What are chalcogenide glasses? Give an account of preparation & uses of network polymers of sulfur.

⇒ Chalcogenide glass are cross-linked amorphous polymers prepared by the quenching of chalcogenide compounds with one or more of the polyvalent elements like As, Ge, In, P.



Uses :-

- > Memory device for computers
- > Ultrasonic delay lines
- > High energy particle detector multipliers.

X - X - X.