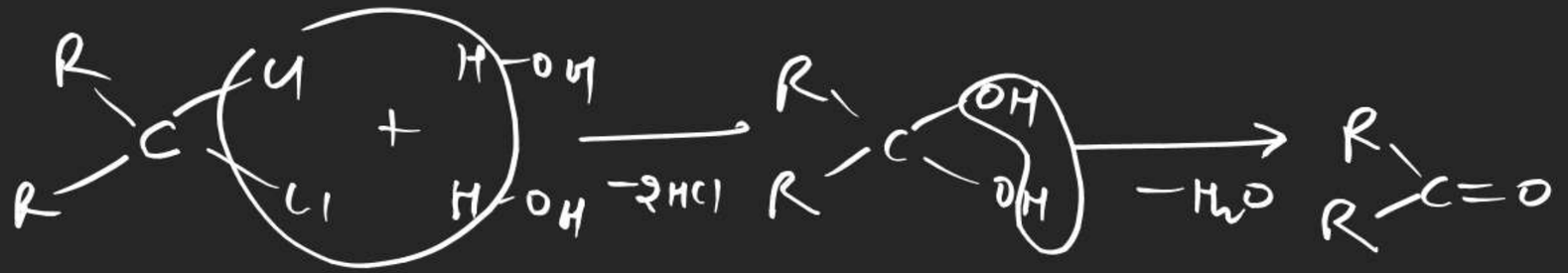
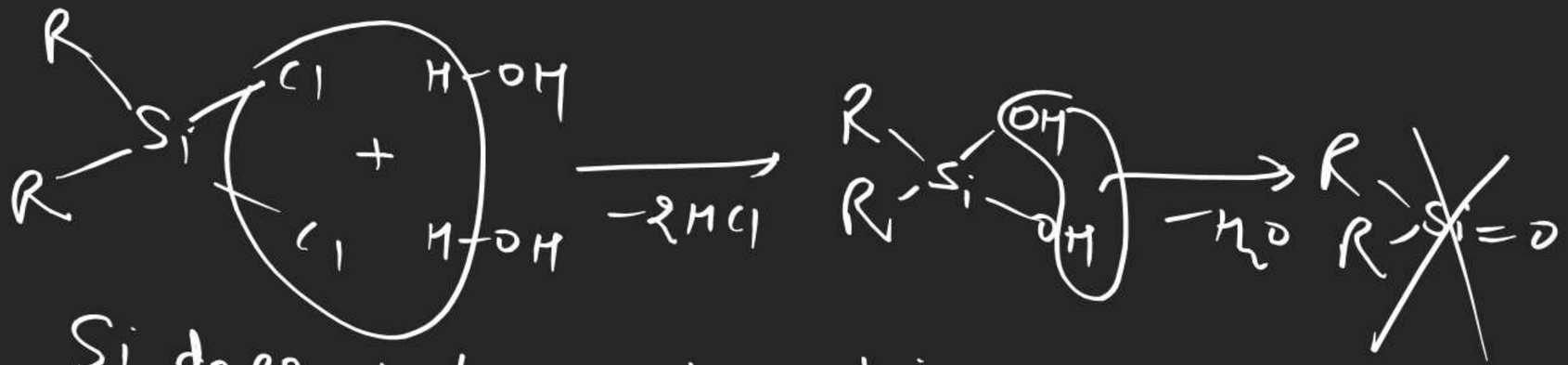
14th group

Silicone





Si does not form π bond with oxygen due to it's large size.

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Silicone

Organo Silicon compound having Si–O–Si linkage are called Silicone

When Alkyl/Aryl Substitute Chloro silane undergoes in hydrolysis followed by polymerisation then diff type of silicones are formed.

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CH_4 = Methane

SiH_4 = silane

C_nH_{2n+2} alkane

Si_nH_{2n+2} silane

Catenation ∝ B.E.

$B.E \propto \frac{1}{Size}$

$B.E \propto \frac{1}{\text{l.p-l.p rep.}}$ (only for 2nd period)

C – C

Si – Si

Ge – Ge

Sn – Sn

Pb – Pb

Note ⇒ higher silanes are not possible due to low Catenation prop.

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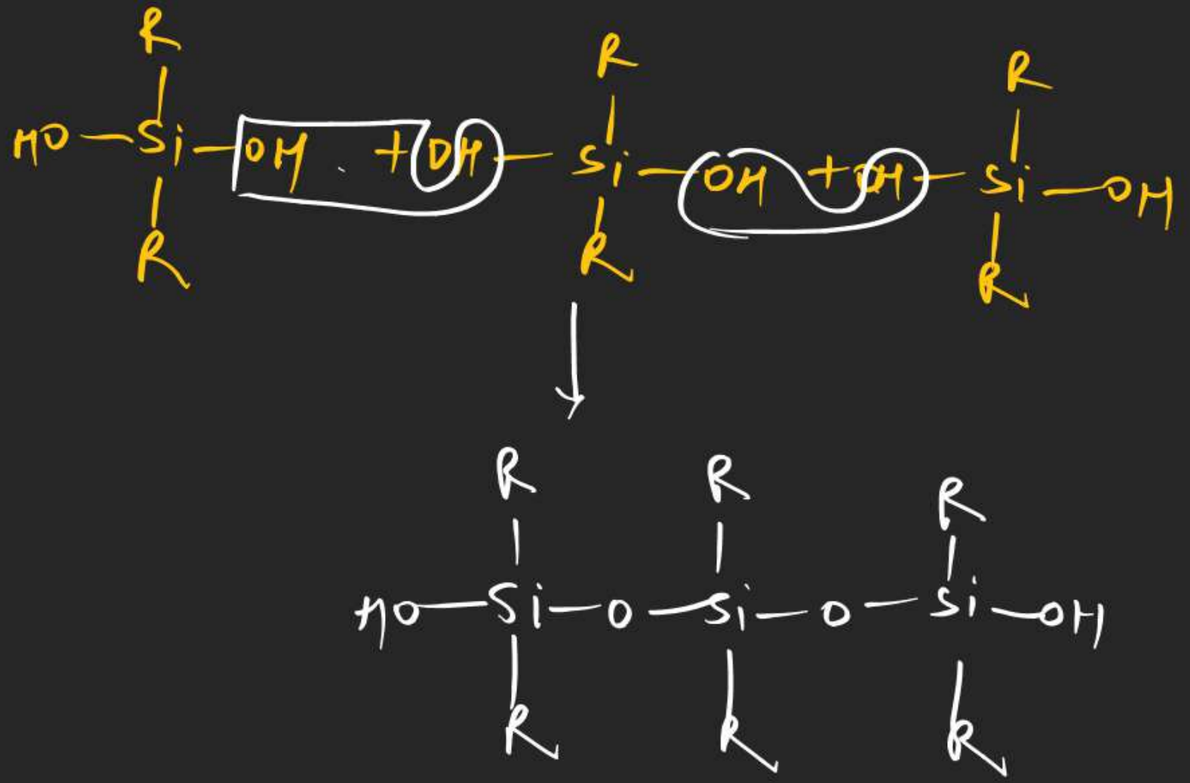
Linear Silicon



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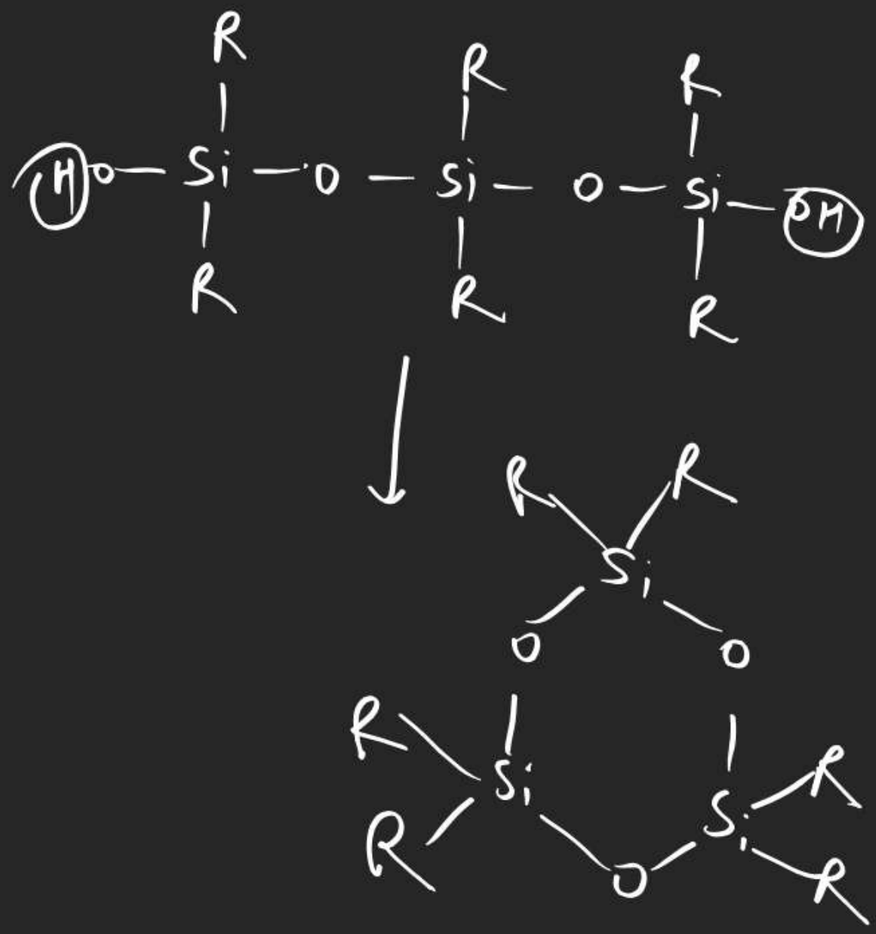
Cyclic Silicon



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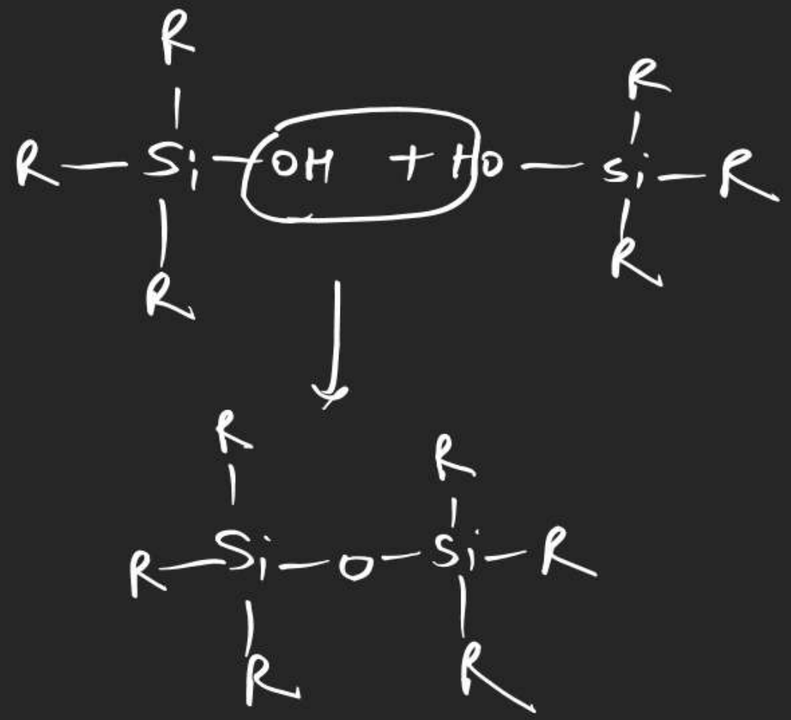
Dimer Silicon



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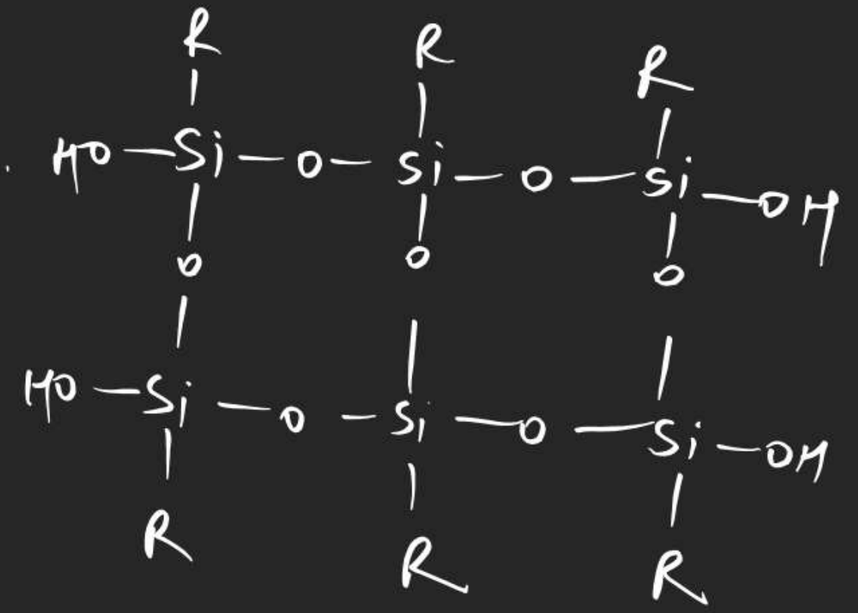
Crosslinked / 3D Silicon



3D network / crosslinked.

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Which of the following Compound form linear silicon.

(a) R_2SiCl_2

(b) R_3SiCl

(c) $RSiCl_3$

(d) $SiCl_4$

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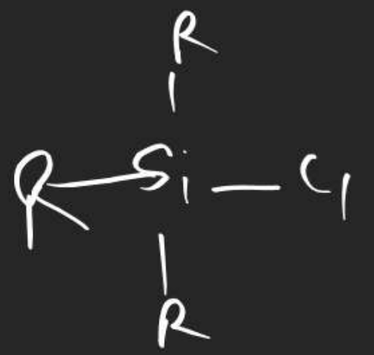
Ques Which of the following Compound act as chain stoping unit.

(1) R_3SiCl

(2) R_2SiCl_2

(3) $RSiCl_3$

(4) $SiCl_4$



Note :→ Cu powder acts as catalyst

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Carbides

- Ionic Carbides (S-Block and Al)
  - Methanide (C^{-4})
    - Be_2C
    - Al_4C_3
  - Acetylide (C_2^{-2})
    - CaC_2
    - BaC_2
  - Allylide (C_3^{-4})
    - Mg_2C_3
- Covalent Carbide (P-Block)
  - SiC
- Interstitial Carbide (d and f Block)
  - Fe_3C

$$Be_2C + H^{+}-\bar{O}H \longrightarrow Be(OH)_2 + CH_4$$

$$Al_4C_3 + H-OH \longrightarrow Al(OH)_3 + CH_4$$

$$CaC_2 + H^{+}-\bar{O}H \longrightarrow Ca(OH)_2 + CH{\equiv}CH$$

$$BaC_2 + H^{+}-\bar{O}H \longrightarrow Ba(OH)_2 + CH{\equiv}CH$$

$$Mg_2C_3 + H-OH \longrightarrow Mg(OH)_2 + \underline{CH_3-C{\equiv}CH}$$

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Al_4C_3

Be_2C

CaC_2

Mg_2C_3

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Carbon mono oxide

① Prep:

$$C + O_2 \xrightarrow{\text{(limit)}} CO$$

②


③ $HCOOH + \text{Conc.}\ H_2SO_4 \longrightarrow CO + H_2O$

(4) from $K_4[Fe(CN)_6]$

$$K_4[Fe(CN)_6] + Conc.H_2SO_4 \longrightarrow K_2SO_4 + FeSO_4 + HCN$$

$$HCN + H_2O \longrightarrow HCOOH + NH_3$$

$$NH_3 + Conc.H_2SO_4 \longrightarrow (NH_4)_2SO_4$$

$$HCOOH + Conc.H_2SO_4 \longrightarrow CO + H_2O$$

① Colourless but burn with blue flame neutral

— S·F·L

— S·R·A

— poisonous

almost in soluble in water

it form complex with Haemoglobin

which is called Carboxy Haemoglobin

CO_2

Carbon di oxide

CO_2

O = C = O

sp

linear | acidic

soluble in water

$CO_2 + H_2O \longrightarrow H_2CO_3$ (acidic)

Green house effect

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Zeolite

3D Silicate

Selective Catalyst

alumino silicate

Cement and glass

3D silicate

man made silicate

Zeolite is used for removal of Hardness.

ZSM-5

is used to convert alcohol to gasoline

Estimation

I_2O_5

$$PdCl_2 + CO \longrightarrow Pd + CO_2$$

Black

absorber $\Rightarrow$ $CuCl_2$