

16th group

O

S

Se

Te

*Po

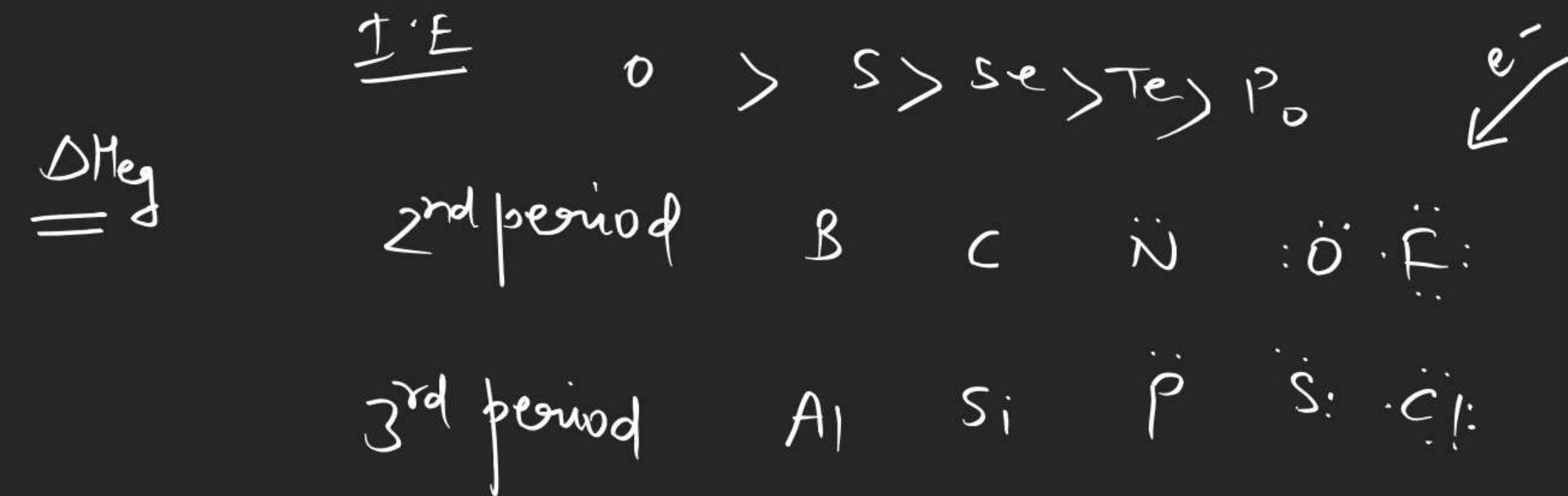
① Chalcogen family

Ore forming family

$$\text{Conf.} = n^2 n p^y$$

Atomic size

O < S < Se < Te < Po



S > O
order S > Se > Te > Po > O

{^o
S}

Se

Te

P₀

Catenation



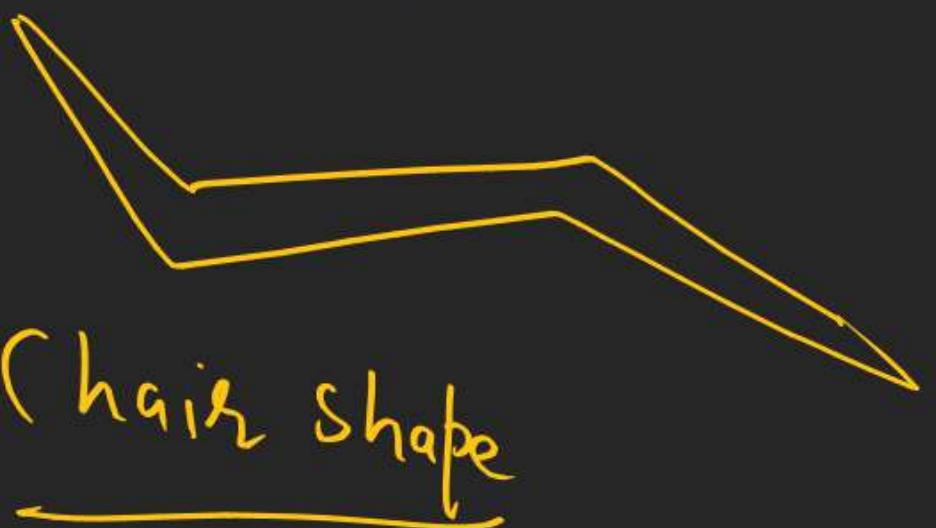
one $\text{O} = \text{O}$ exist but $\text{S} = \text{S}$ does not exist

IV due to large size $3\text{P}_\pi - 3\text{P}_\pi$ bond does not exist

but $\text{S}(\text{C}_6\text{H}_5)$ acc. to MOT and it is paramagnetic.



S_6 = engel's sulphur



O }
S } non metal

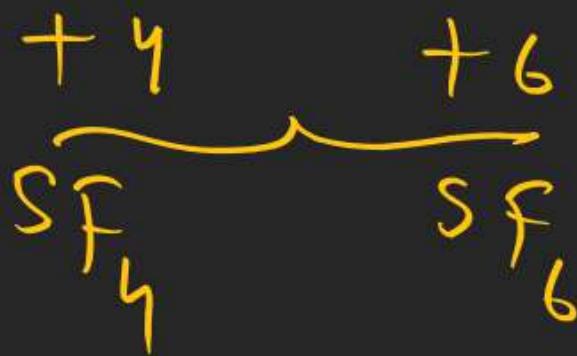
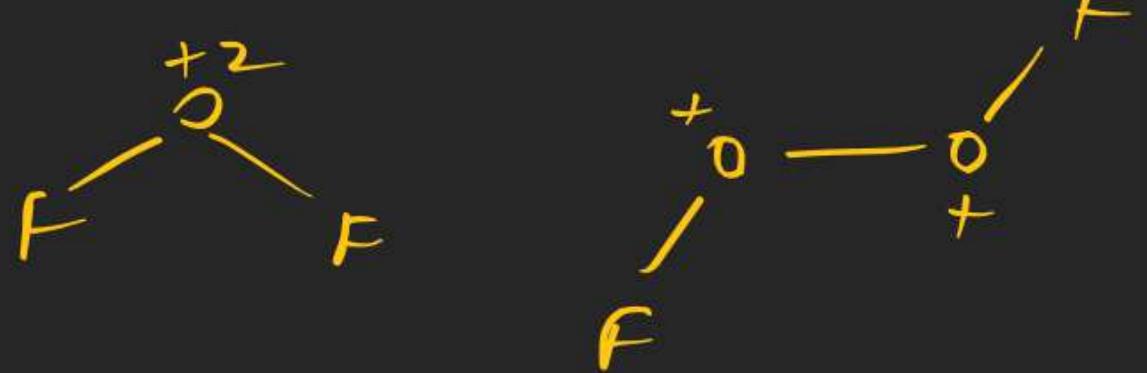
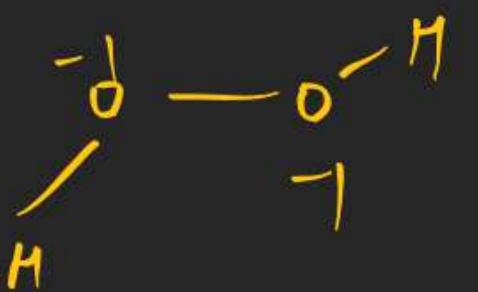
Se }
Te } metalloides

Po — metal

Note \Rightarrow Po radioactive

Oxidation state

$$O = -2$$

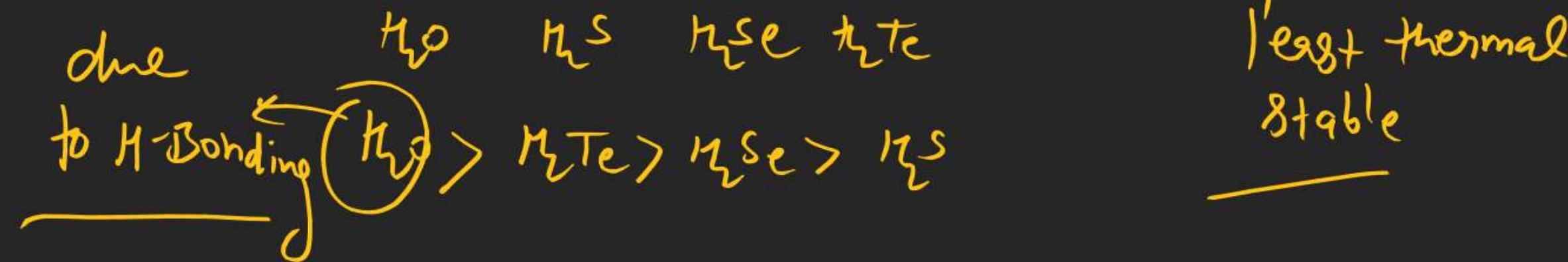
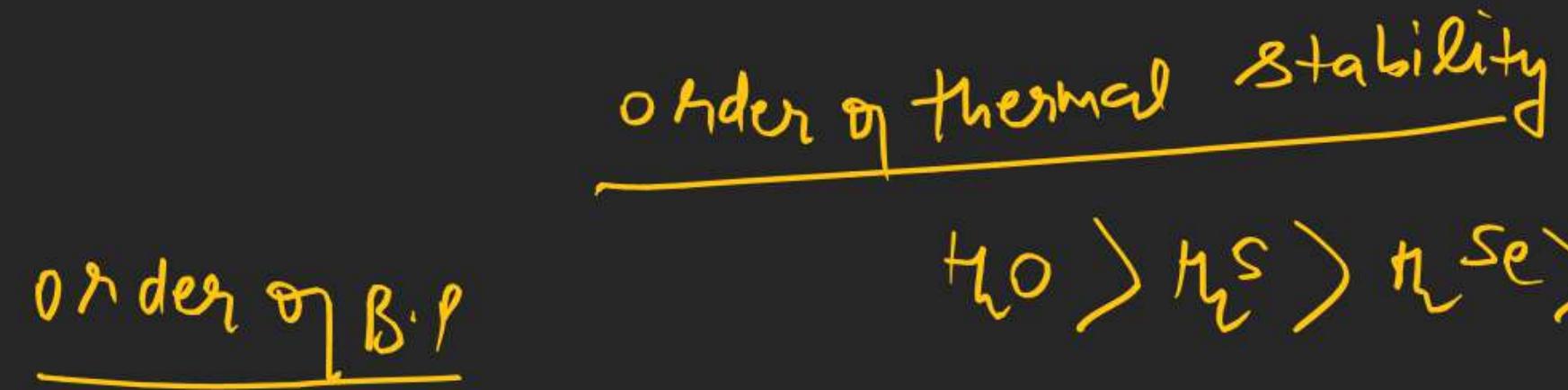


down the group - i.e. \downarrow
Metallic ch. \uparrow

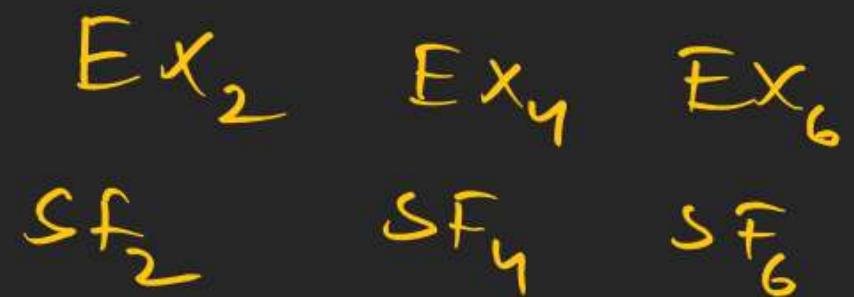
① Reactivity h



order of acidic character



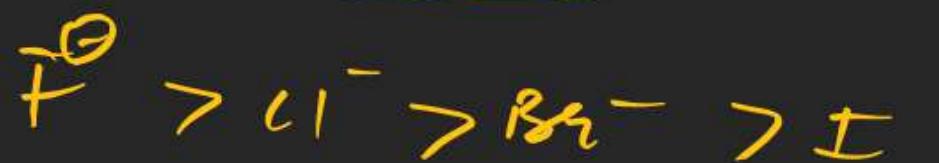
Reaction with Halogen



Note = Hexahalides SCl_6
 SBr_6 } do not exist
 SI_6 } due to steric

$\text{SF}_4 \rightarrow$ gas $\text{SeF}_4 =$ liq. TeF_4 solid prep.

Order of reactivity

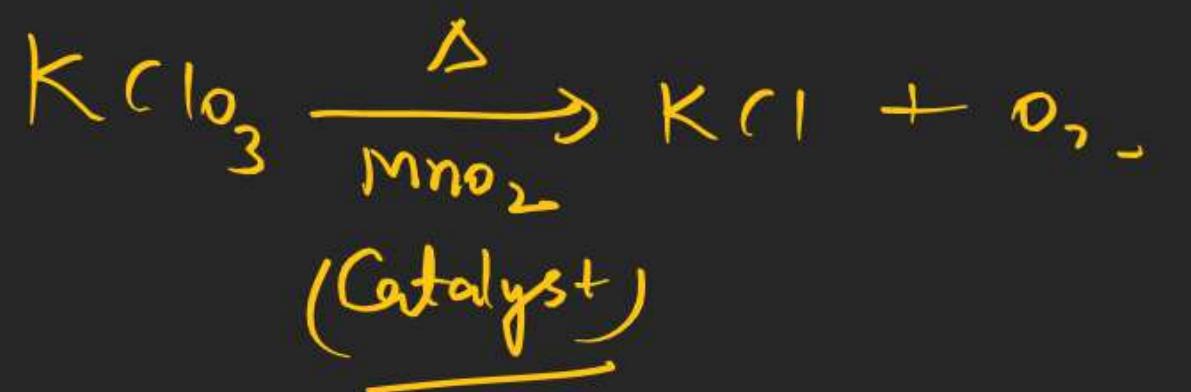


Reaction with Oxygen

Reducing prop. ↓ down the group



Oxygen
Prep. air





- ① allotrop of oxygen
- ②



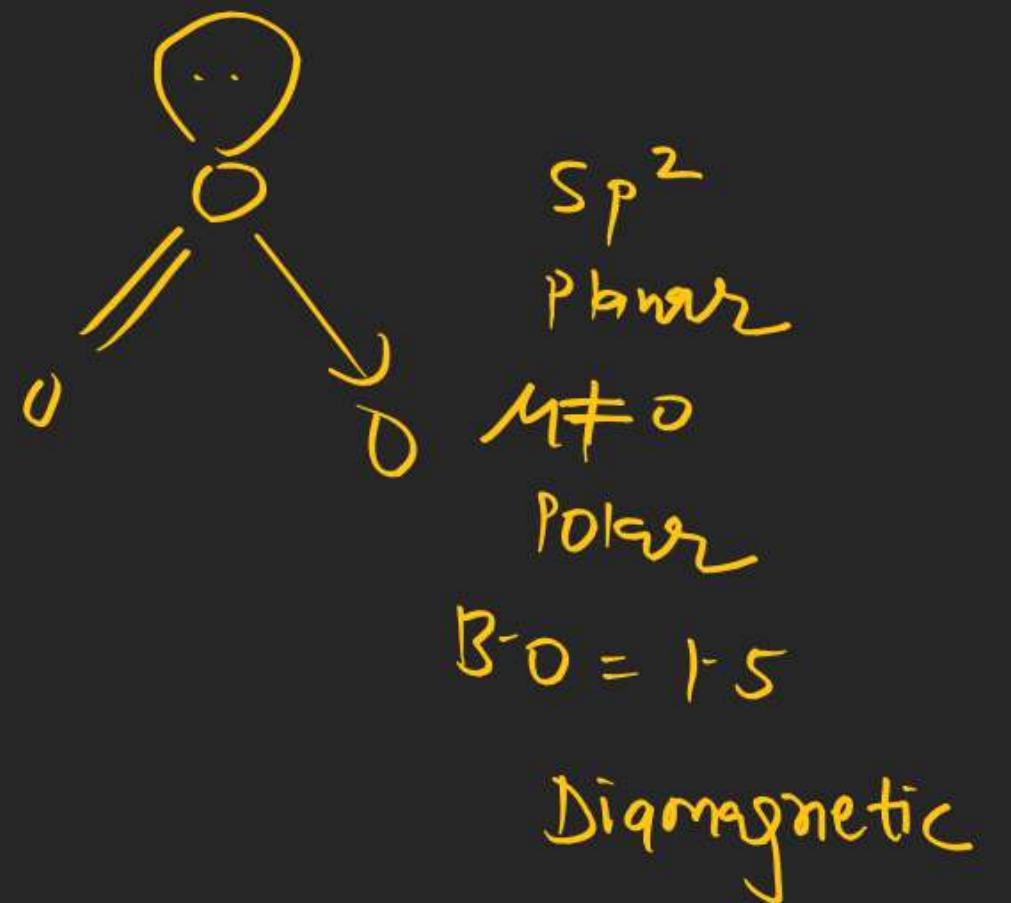
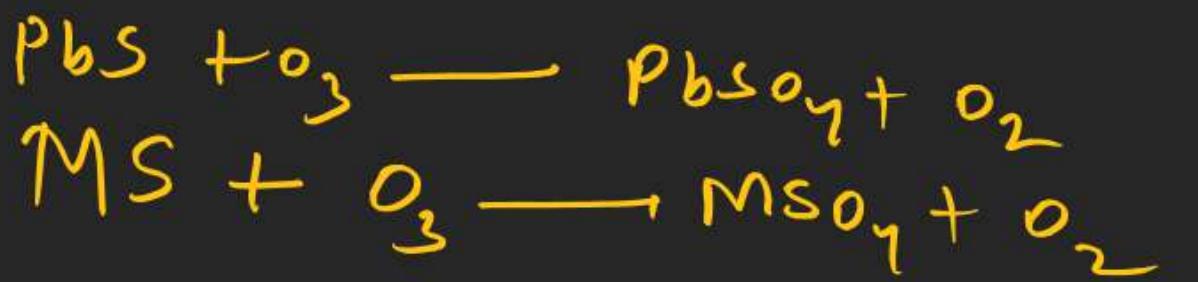
depletion of O_3 layer

Prop.

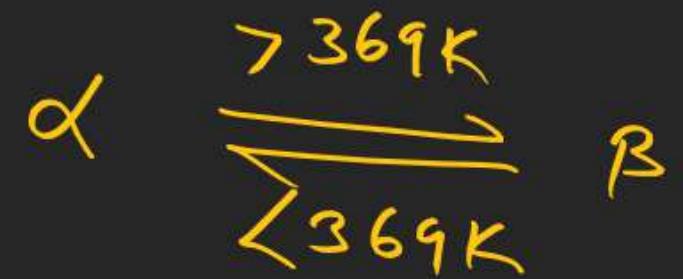
- ① Pale blue gas, dark blue liq.
and violet black solid
- ② fishy smell
- ③ toxic enough [more than KCN]
- ④ Oxidising agent



O_3 is strong oxidising agent next to F



allotrop of sulphur



at 369 K both allotrop stable
and it is called transition temp.

① α (Rhombic Sulphur)

① yellow Col.

② it is prep. by evaporation of solution

of Rose Sulphur

③ It is insoluble in water but soluble in Carbon di Sulphide (CS_2)

(β) Monoclinic Sulphur

- ① Colourless
- ② Insoluble in water and soluble in CS_2

both have S_8 [Crown Shape]



Viscosity of S

M.P of S = 112.8

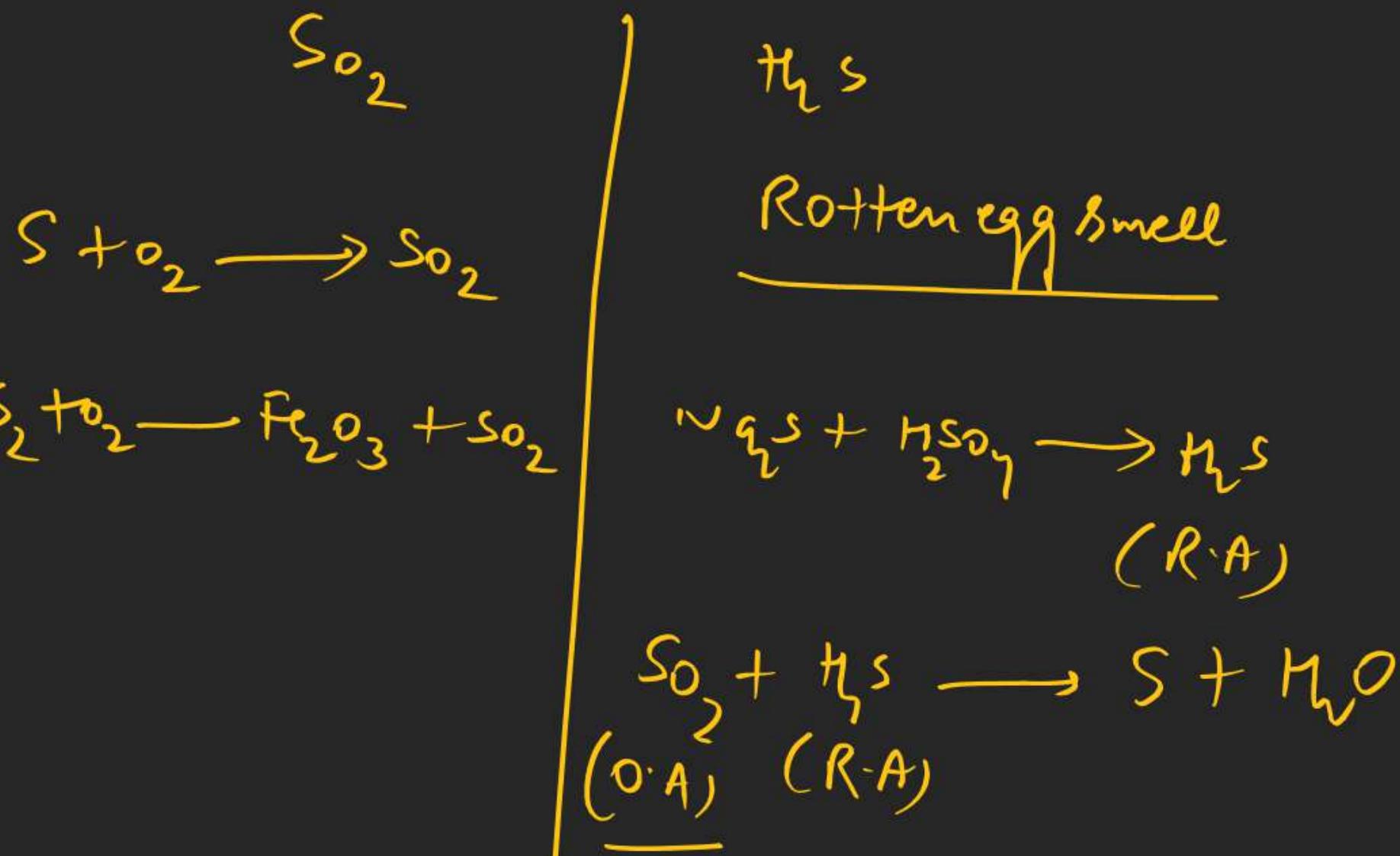
> 112.8 to 160 Viscosity ↓

b/wt > 160 Viscosity ↑



Amorphous form

- ① Milk Sulphur
- ② Plastic Sulphur
- ③ Colloidal Sulphur



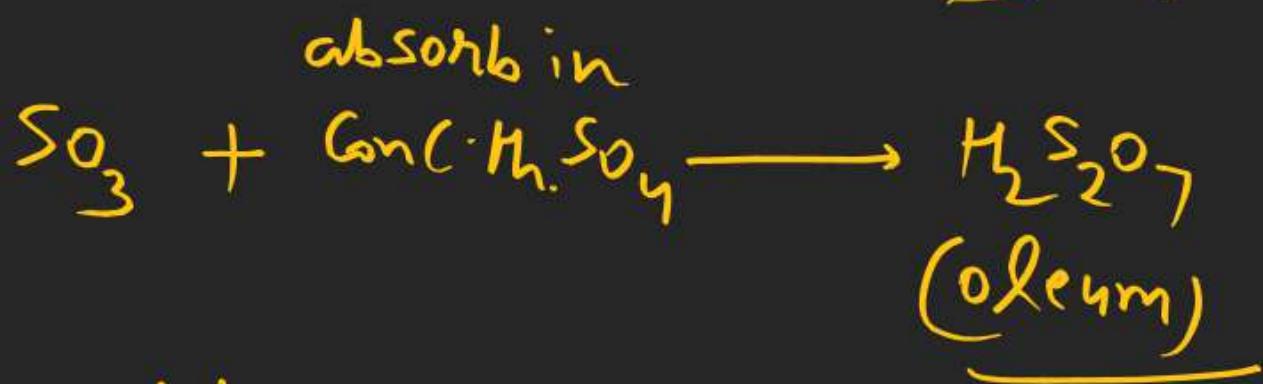
Note = Drying agent

fused CaCl_2 , Al_2O_3 [dehydrated] P_2O_5

but not H_2SO_4

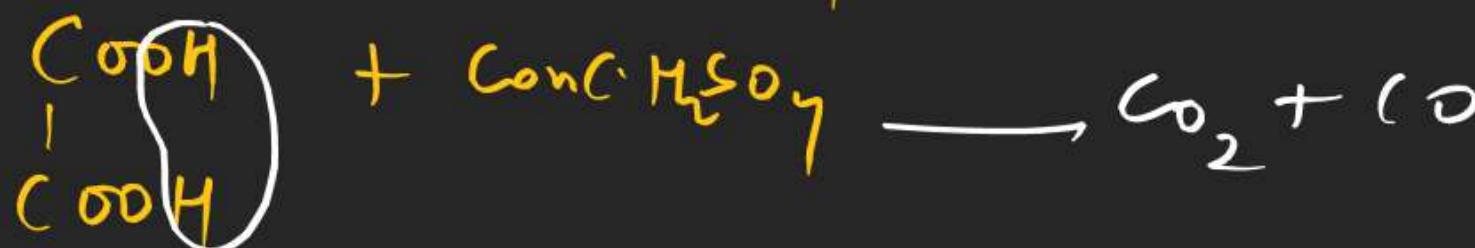


Prep: H₂SO₄ Contact process



On dilution of oleum we get desired
conc of H₂SO₄

Conc. H_2SO_4 is good dehydrating agent



Note \rightarrow P_2O_5 is a better dehydrating agent than H_2SO_4

