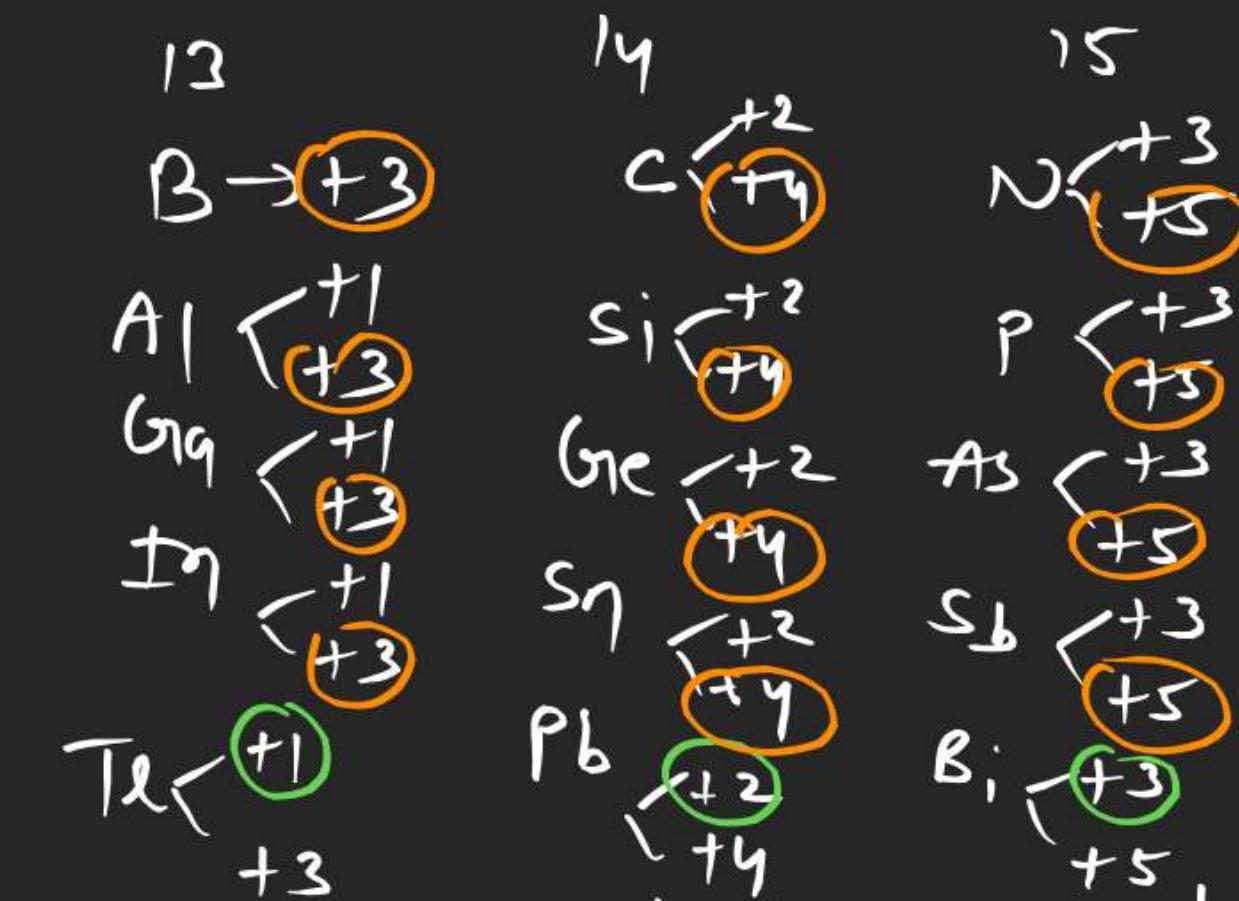


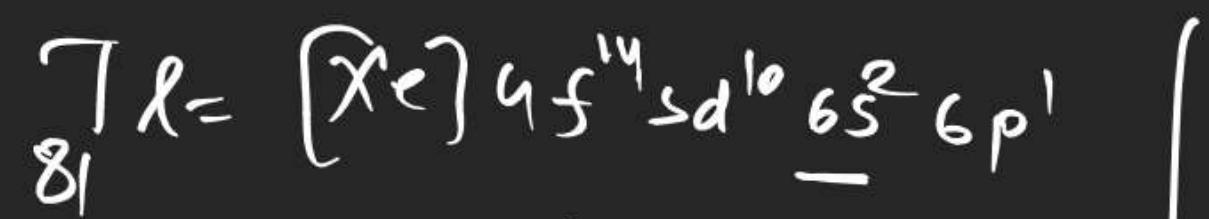
## Inert pair effect



Note  $\Rightarrow$  generally higher oxidation state becomes more stable  
then the lower oxidation state but in P-block

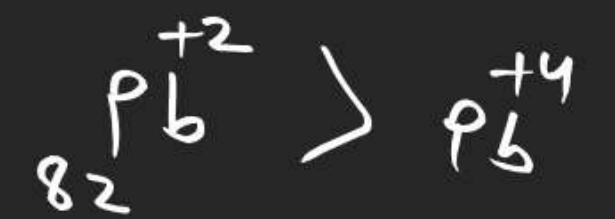
Vishal Joshi  
TEDx Talk

on moving down lower oxidation state becomes  
more stable than higher due to poor S.E of 4f  
& 5s shell.



if sq  $\leq s^2 < p^1$   
 $M^{\oplus}$  

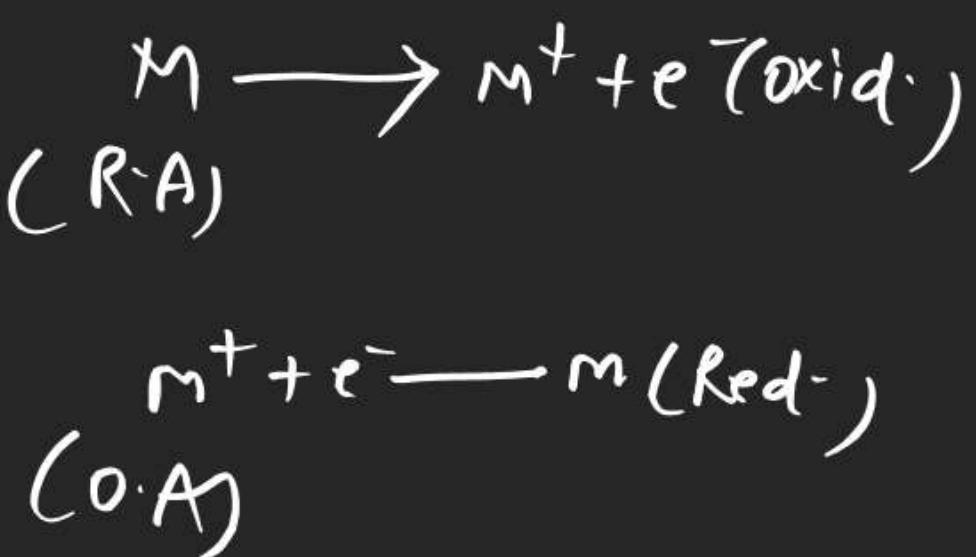
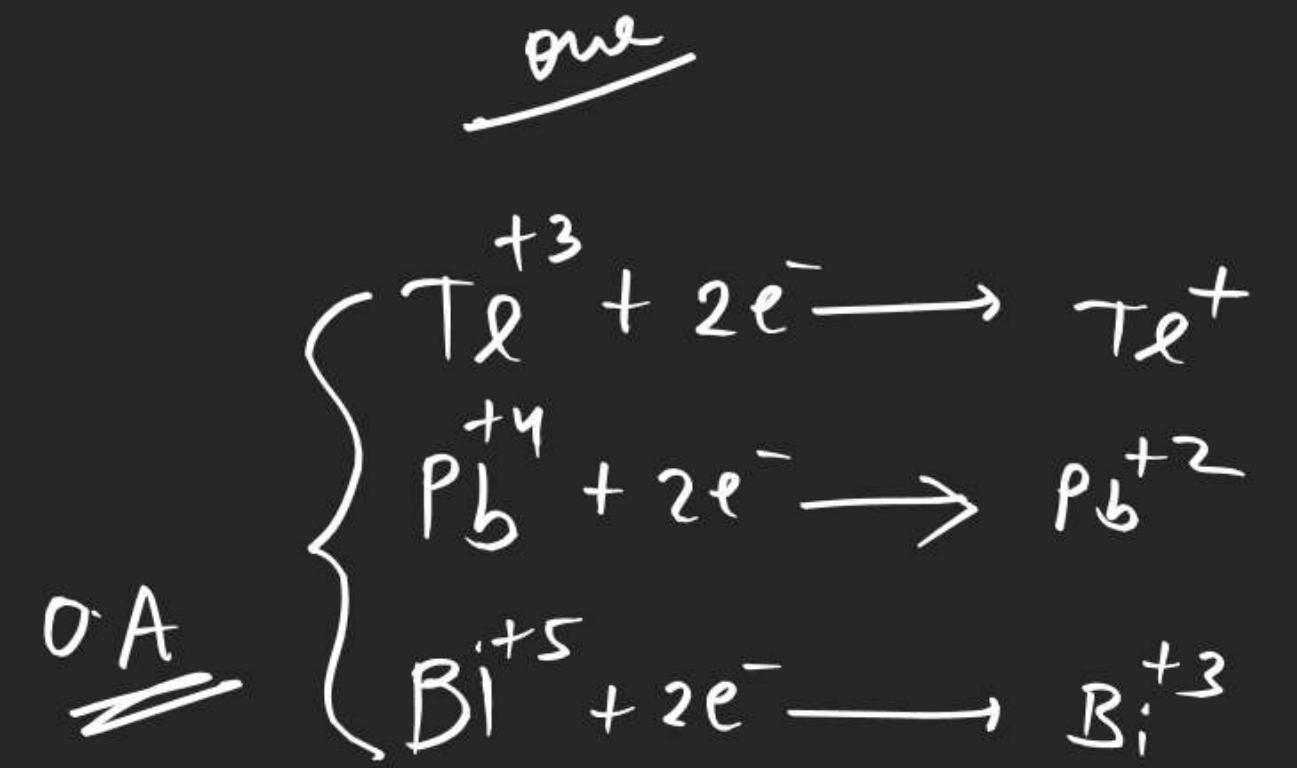
Stability



$$\boxed{S.E}$$

$$\boxed{S > P > d > f}$$

Note  $\Rightarrow$  The tendency of inertness of  $ns\ e^-$  towards bonding is called inert pair effect



Order of stability of di halide



Order of stability of tetrahalides

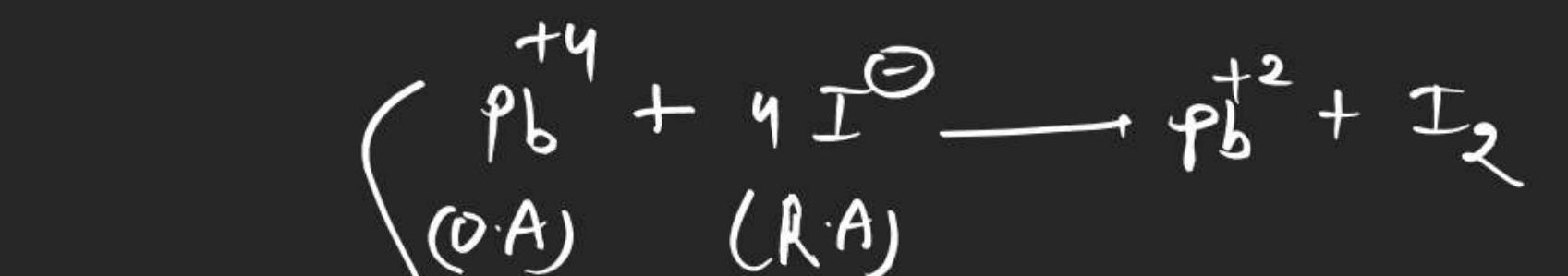


Ques Which of the comp. is oxidising agent

- ①  $\text{Co}_2$
- ②  $\text{SiO}_2$
- ③  $\text{GeO}_2$
- ④  $\text{PbO}_2$

Order  $\text{Co}_2 < \text{SiO}_2 < \text{GeO}_2 < \text{SnO}_2 < \text{PbO}_2$

one  $\text{PbI}_4$  does not exist



due to  
Redox  
Reaction

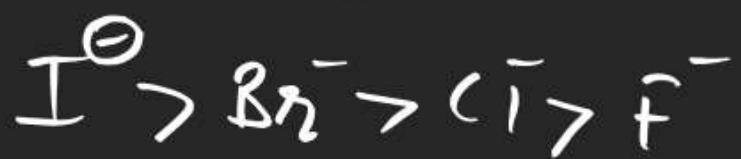
Te  $\text{I}_3^-$  does not exist

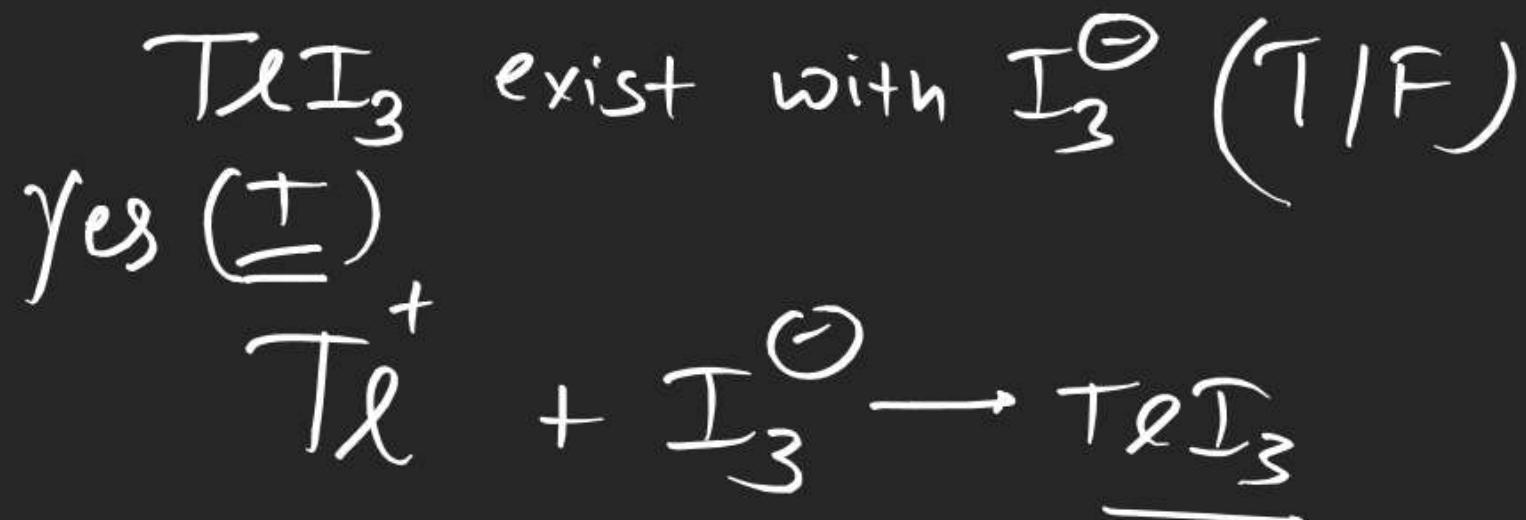


Bi  $\text{I}_5^-$  does not exist

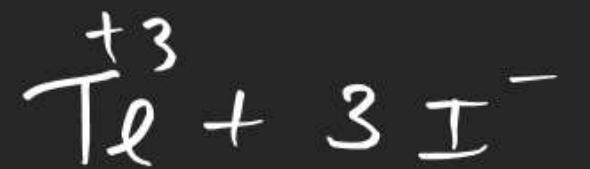


Reducing Power





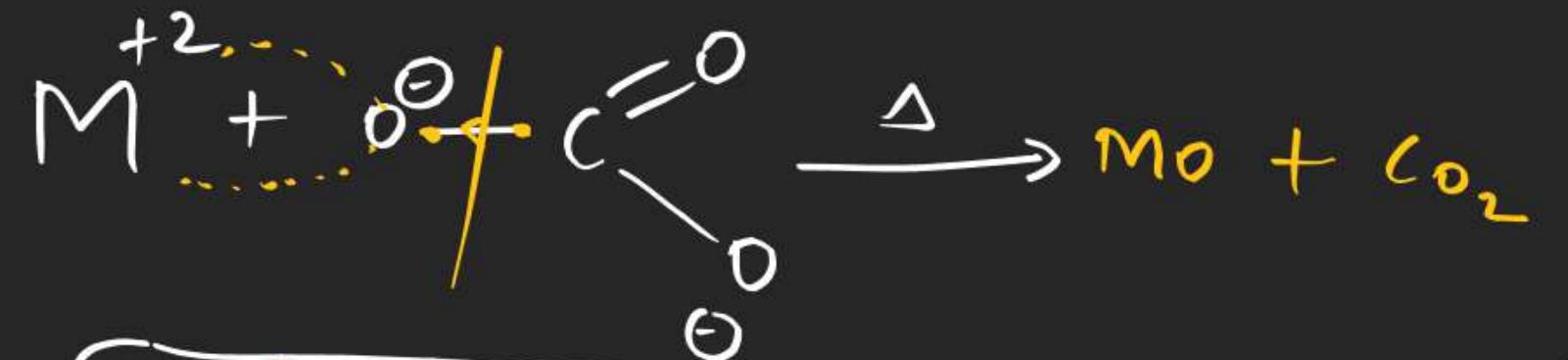
$TlI_3$  does exist



# Application of Fajans Rule

## ① Thermal Stability

### ① T-s of Ionic compound Having polyatomic anion



\* 
 $\uparrow$  T-s of I-c having polyatomic anion

Polyatomic	Anion	mono atomic
$\text{CO}_3^{2-}$		$\text{F}^-$
$\text{HCO}_3^-$		$\text{O}^{2-}$
$\text{NO}_3^-$		$\text{N}^{3-}$
$\text{SO}_4^{2-}$		

Key point

Li      Be  
Na      Mg  
K      Ca  
Rb      Sr  
Cs      Ba

$$\phi = \frac{\text{charge}}{\text{size} \uparrow}$$

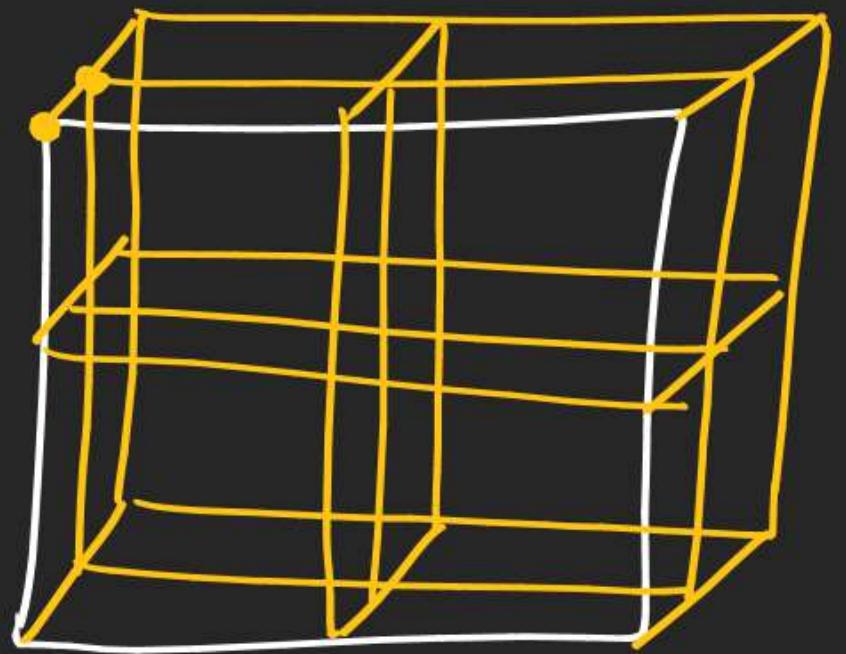
$\phi \downarrow$  T-s of polyatomic  $\uparrow$

- Order of T-S
- $\text{Li}_2\text{CO}_3 < < \text{Cs}_2\text{CO}_3$
  - $\text{BeCO}_3 < < \text{BaCO}_3$
  - $\text{Li}_2\text{SO}_4 < < \text{Cs}_2\text{SO}_4$
  - $\text{BeSO}_4 < < \text{BaSO}_4$
  - $\text{LiNO}_3 < < \text{CsNO}_3$
  - $\text{Be}(\text{NO}_3)_2 < < \text{Ba}(\text{NO}_3)_2$
  - $\text{NaHCO}_3 < < \text{CsHCO}_3$
  - $\text{Be}(\text{HCO}_3)_2 < < \text{Ba}(\text{HCO}_3)_2$

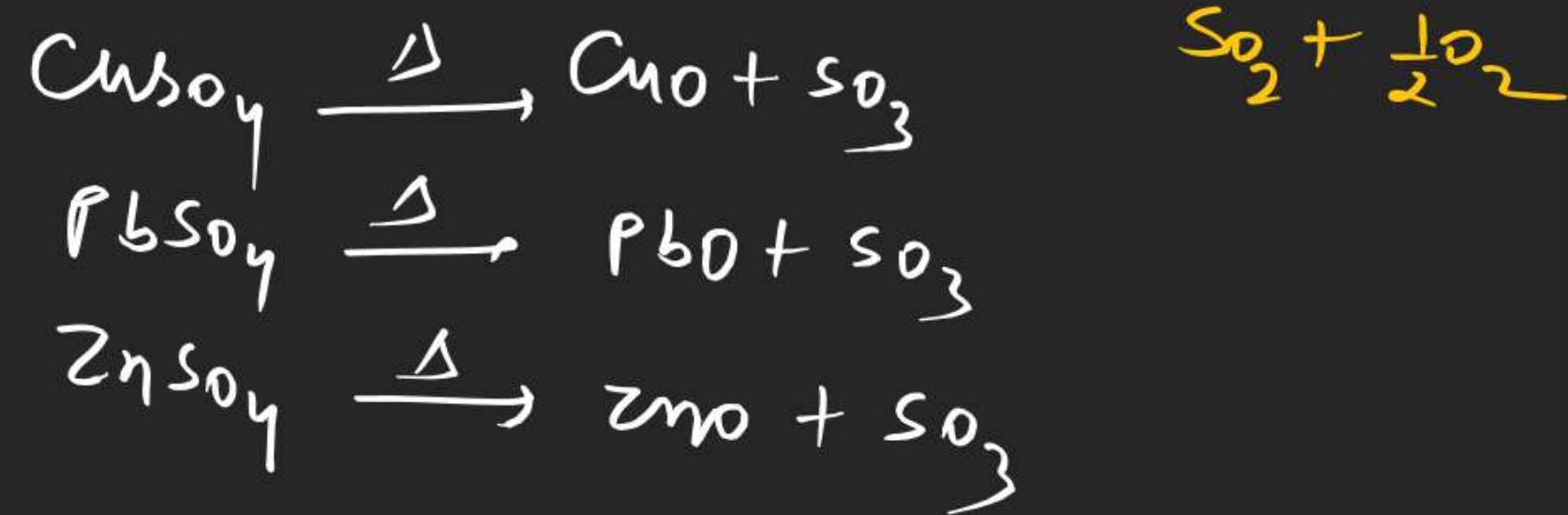
Heating effect



Note  $\Rightarrow$  Carbonate salts of Na & Rb & Cs  
do not decompose on Heating  
because they melt on high temp.



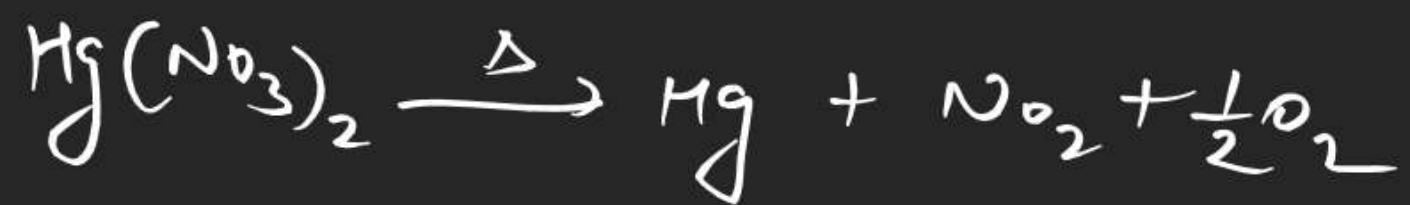
## Heating of Sulphate



Li  
 K  
 Ca  
 Na  
 Mg  
 Al  
 Mn  
 Zn  
 Cr  
 Fe  
 Cd  
 Co  
 Ni  
 Sn  
 Pb  
 Hg  
 Cu  
 Mg  
 Ag  
 Au

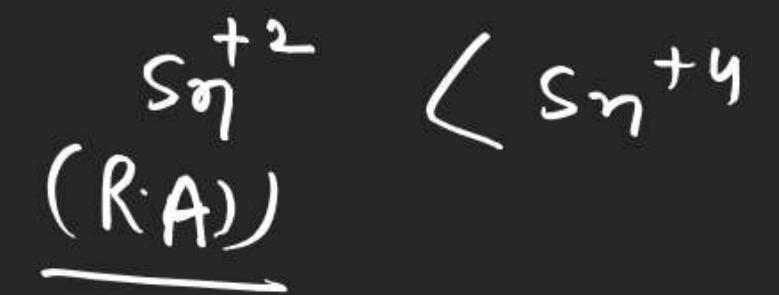


Note  $\Rightarrow$  Pt Mg Ag these are native [less Reactive] metal so their metal oxides are less stable so further decompose in metal and oxygen.



Ques Which of the following compound give metal and oxygen on heating

- ①  $\text{KNO}_3$  ②  $\text{NaNO}_3$   ③  $\text{AgNO}_3$   ④  $\text{Pb}(\text{NO}_3)_2$



one  $HgCl_2$  and  $SnCl_4$  do not exist together  
explain why

