

# Qualitative Analysis

Colour :

State :

Solubility :

Test of Acidic radicals

Test of Basic radicals

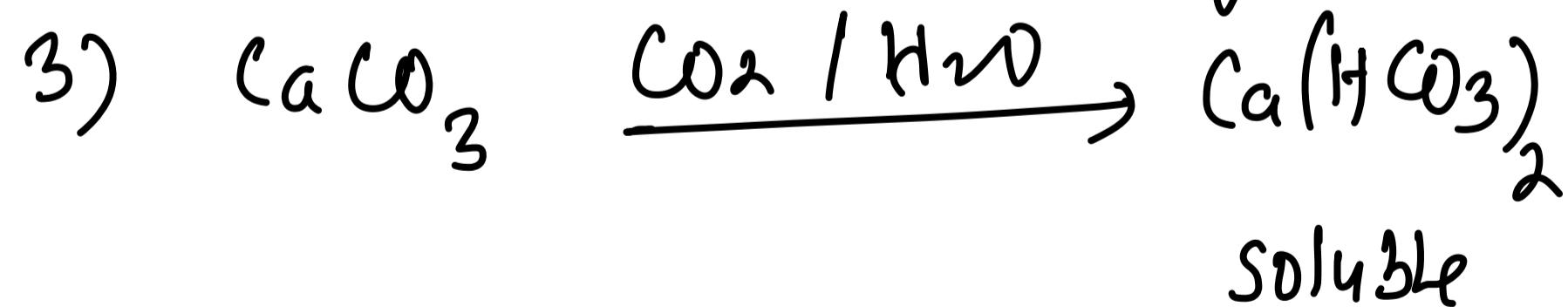
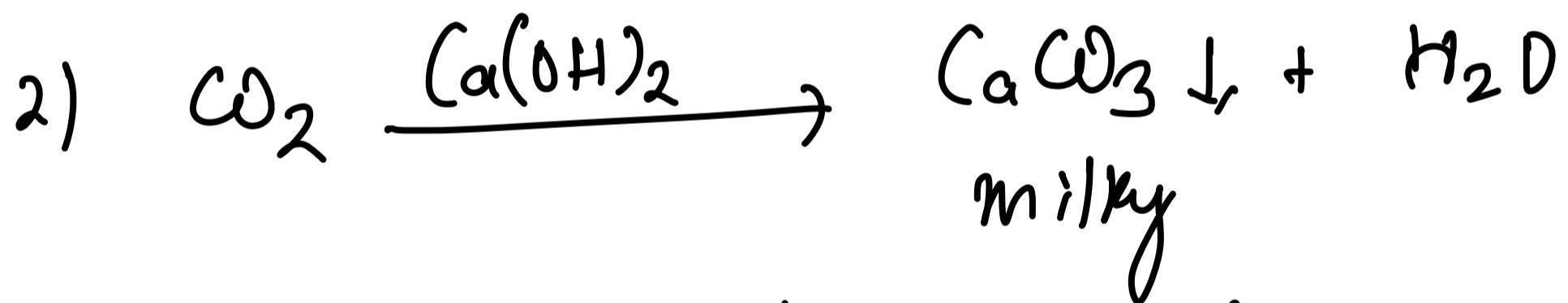
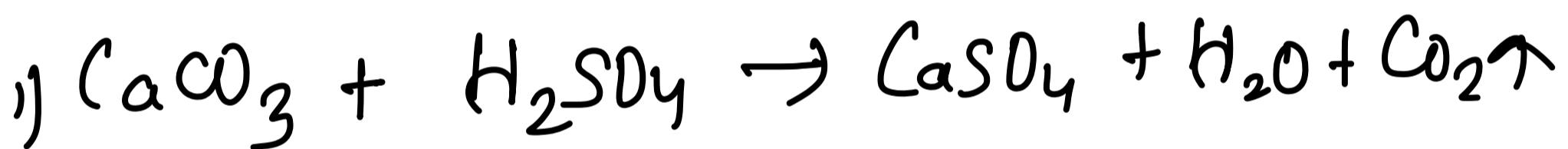
Action of heat

## Acidic Radicals

Add dil HCl or H<sub>2</sub>SO<sub>4</sub>

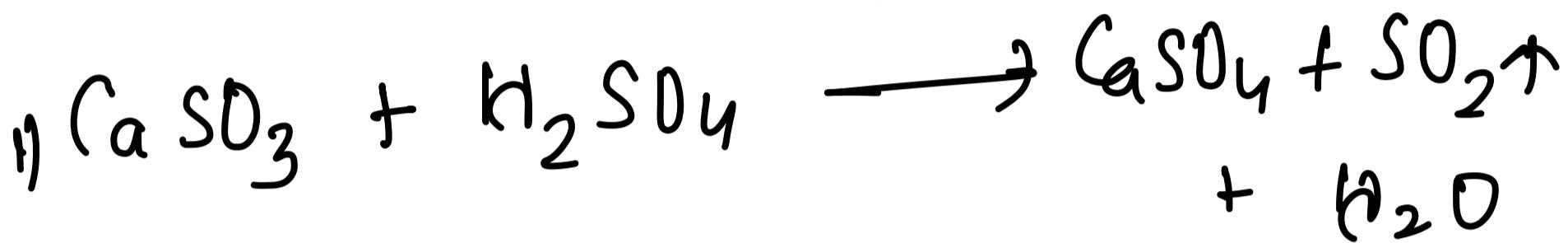
Carbonate CO<sub>3</sub><sup>2-</sup>

Brisk effervescence of colourless  
gas CO<sub>2</sub>

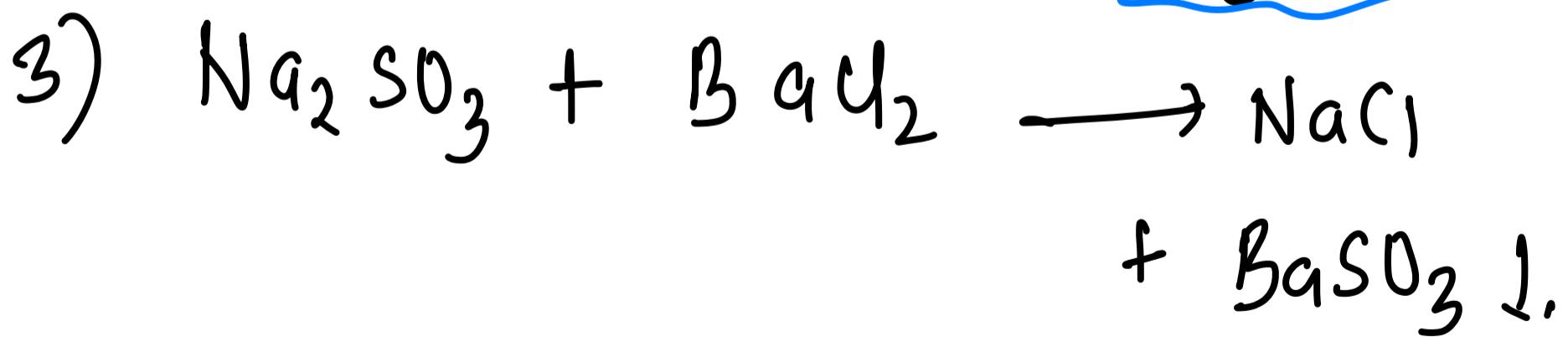
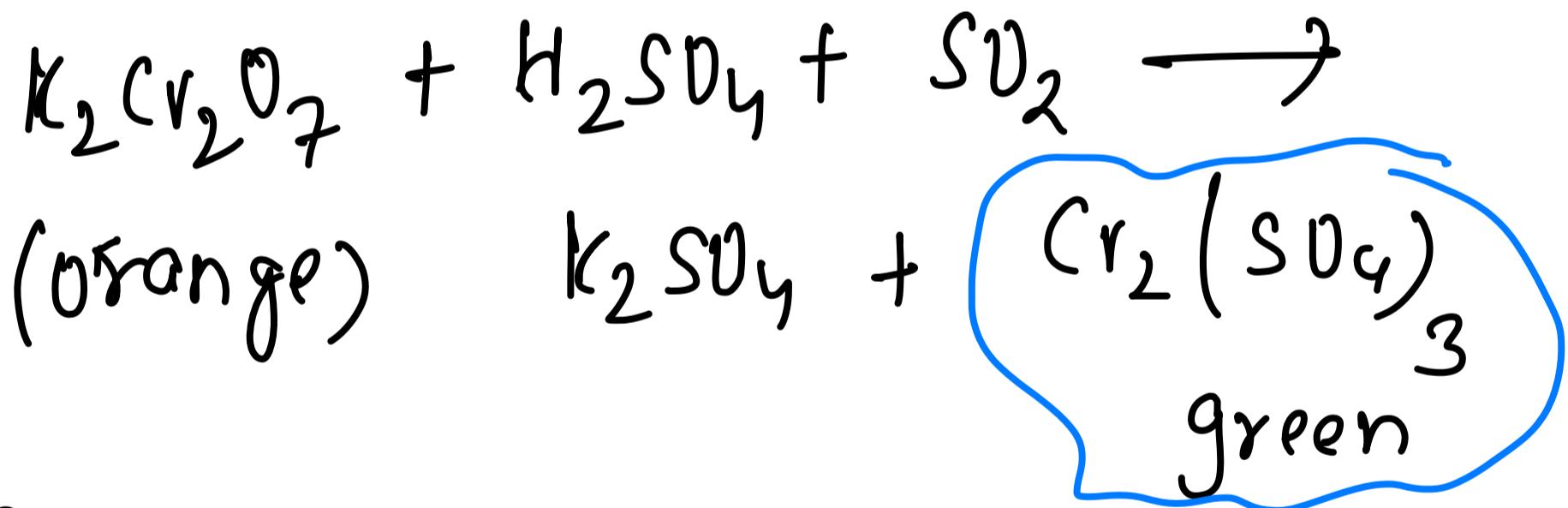


Sulphite ( $\text{SO}_3^{2-}$ )

colourless gas with suffocating  
odour of burning Sulphur

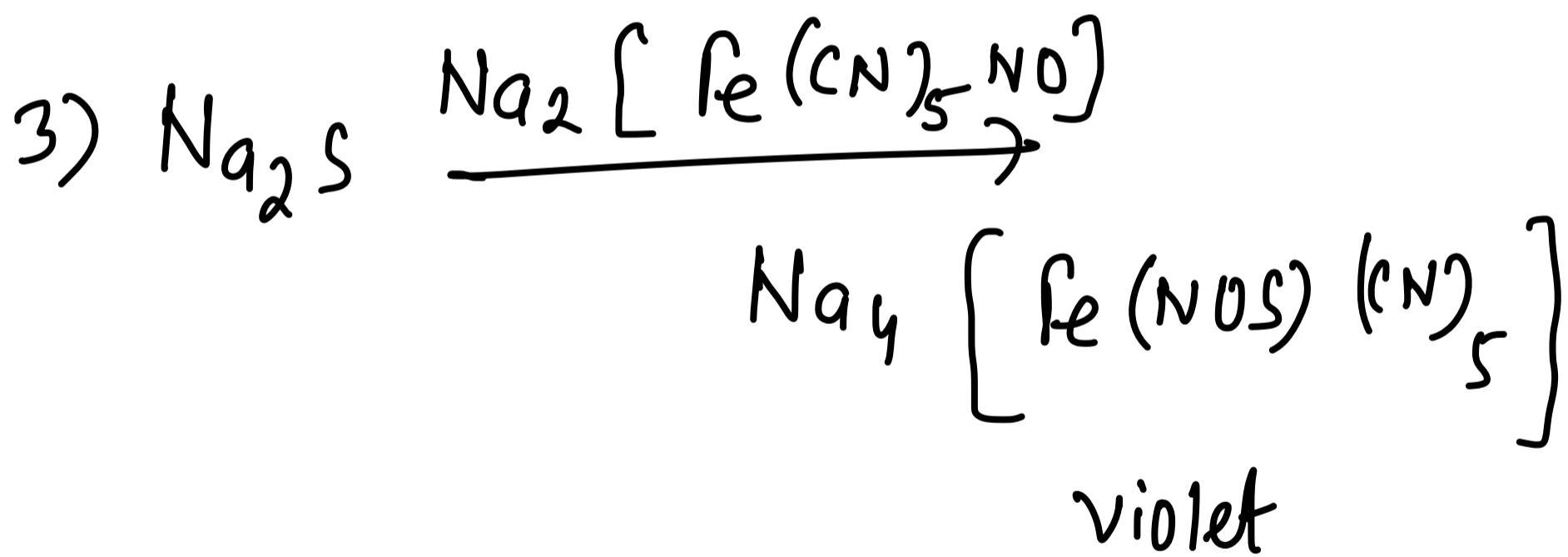
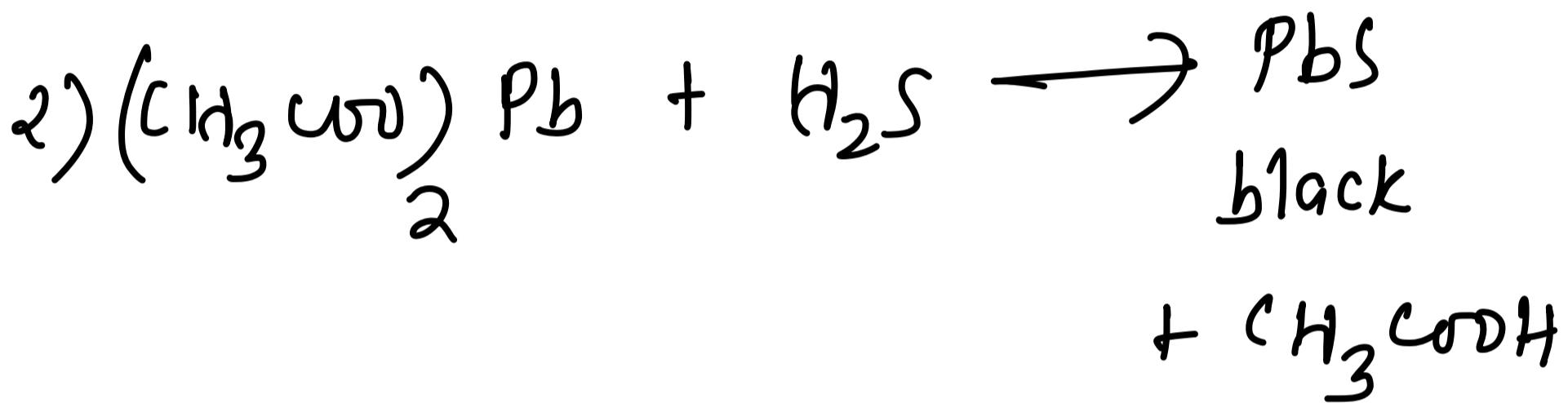
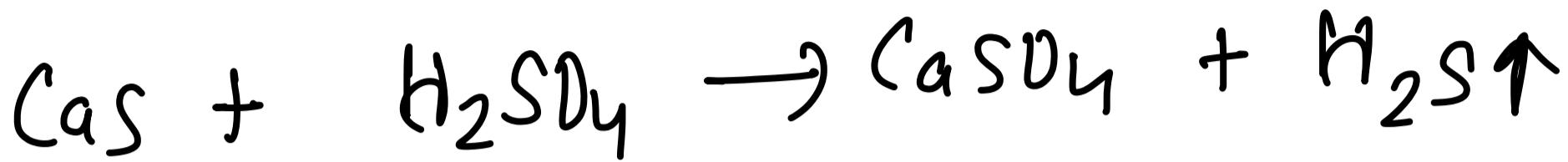


2) gas is moistened with  $\text{K}_2\text{Cr}_2\text{O}_7$  acid



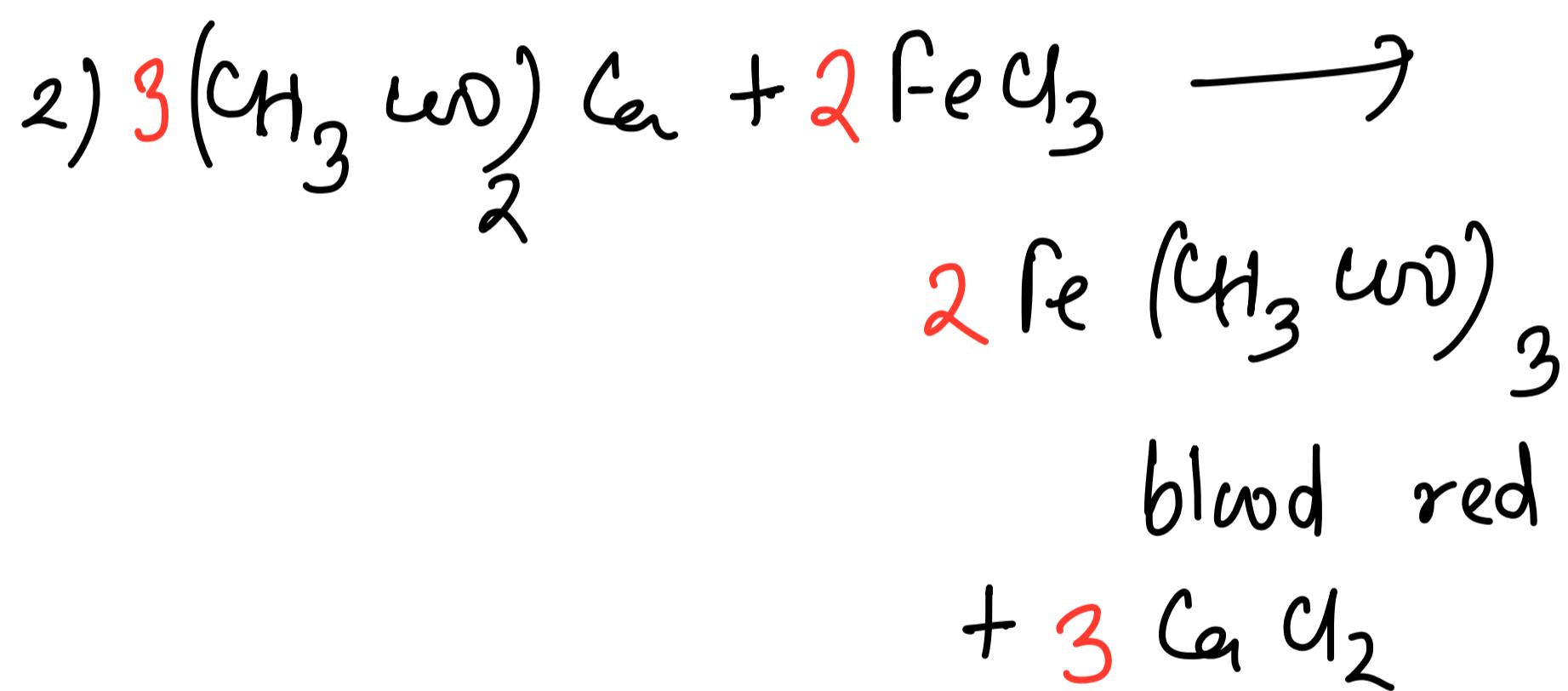
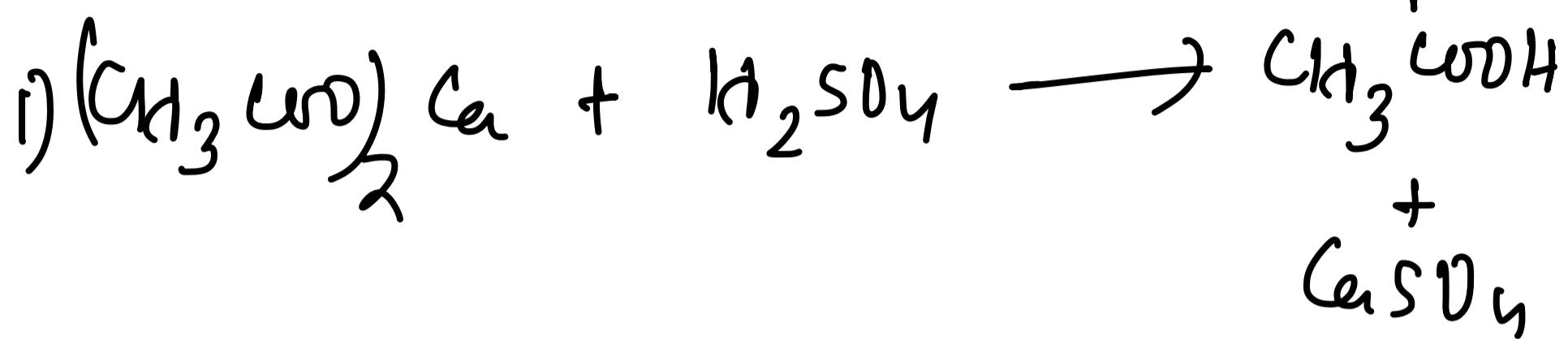
## Sulphide : $S^{2-}$

1) colourless gas with rotten egg

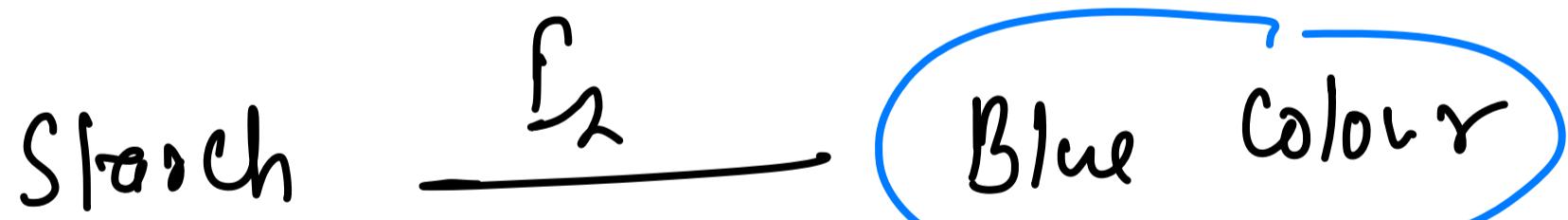
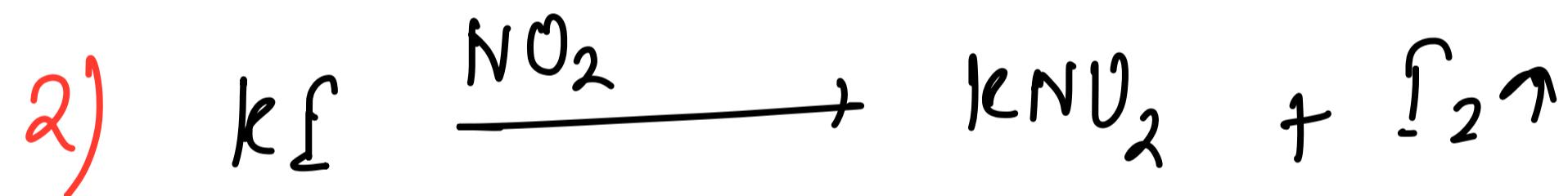
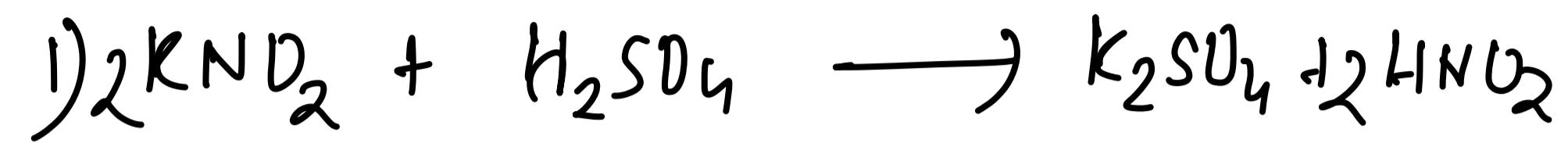


Acerate (CH<sub>3</sub> CO)

Smell of Vinegar



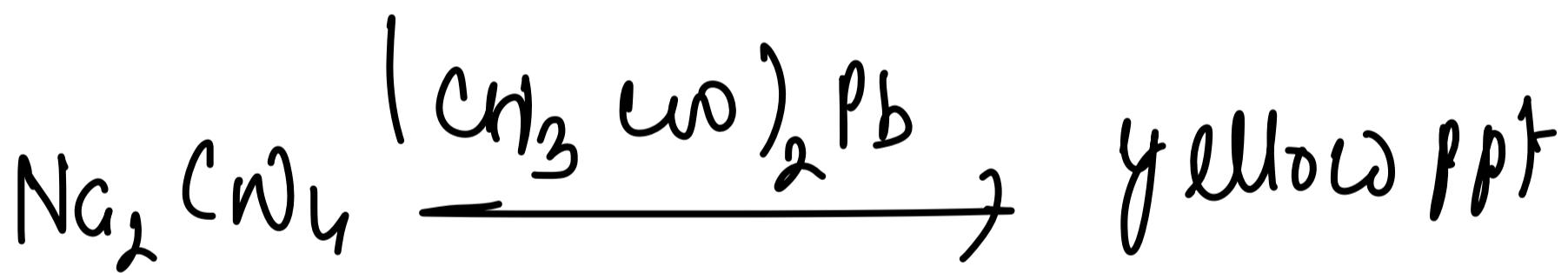
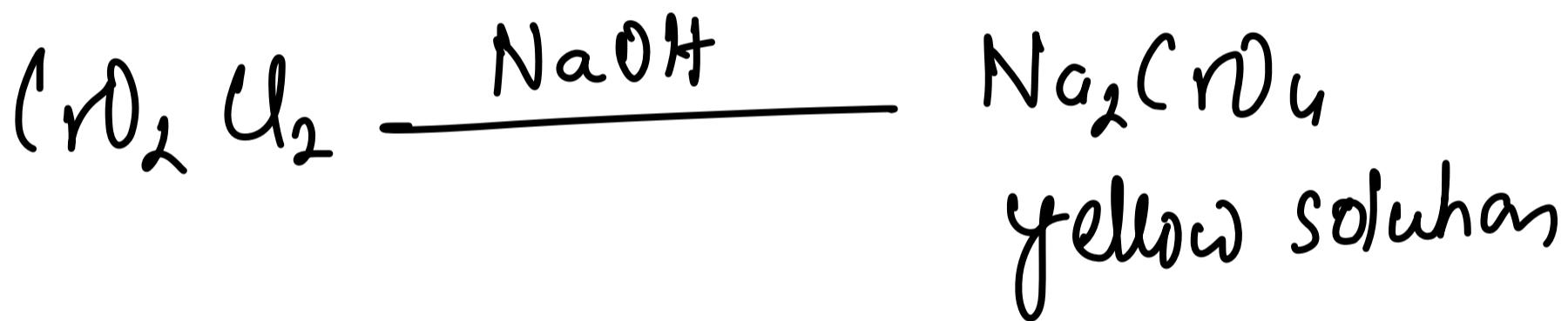
Nitrile :  $(NO_2^-)$  reddish brown gas



## Chloride (Cl<sup>-</sup>)

Chloride salt with  $K_2Cr_2O_7$ ,  $H_2SO_4$

On heating  $\rightarrow$  orange red vapours  
 $(CrO_2Cl_2)$

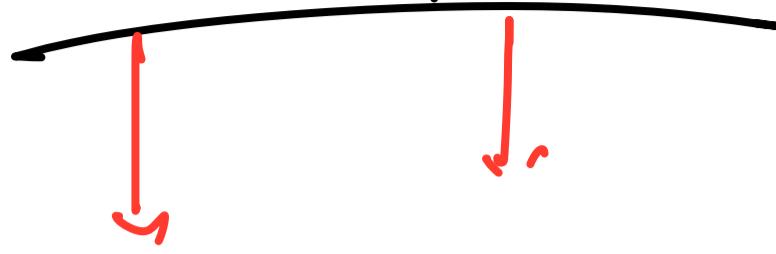


---

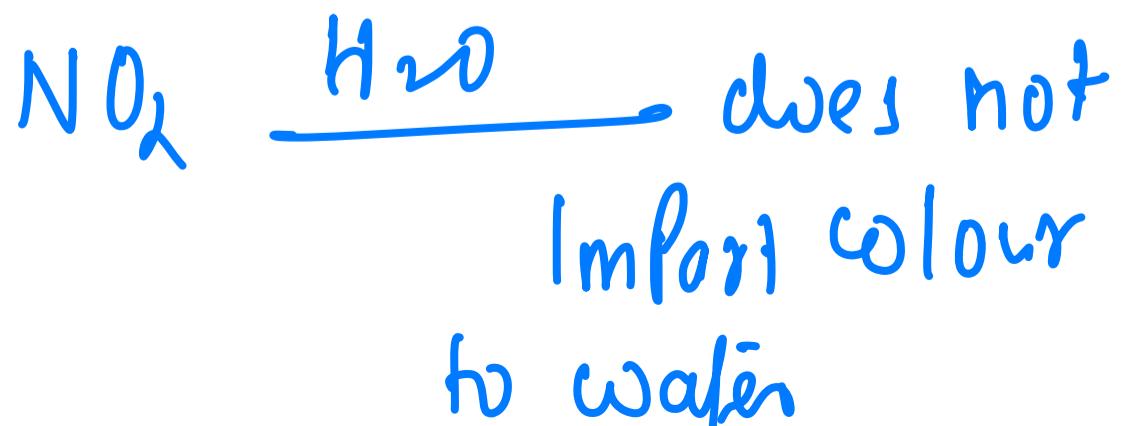
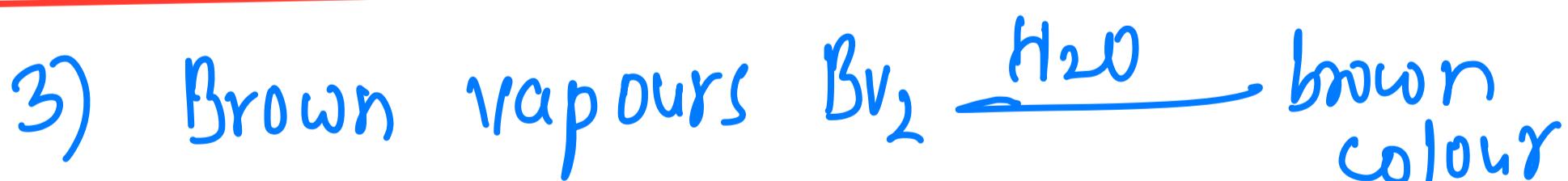
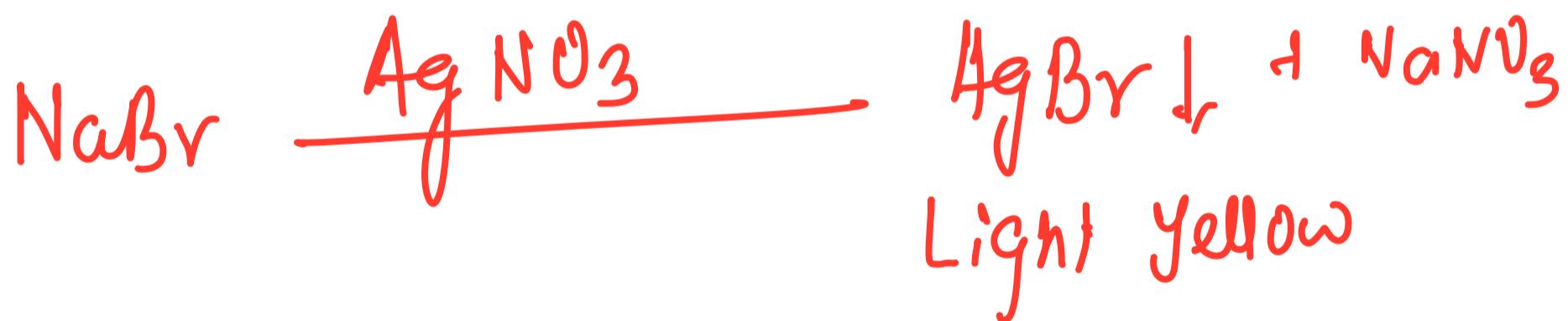
Chlorides of Hg, Ag, Pb, Sn

Chromyl Chloride test X

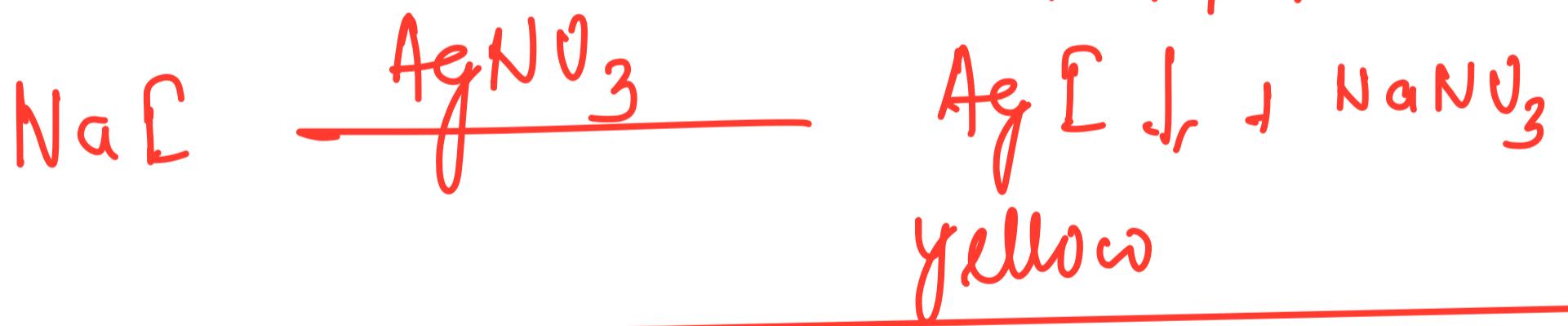
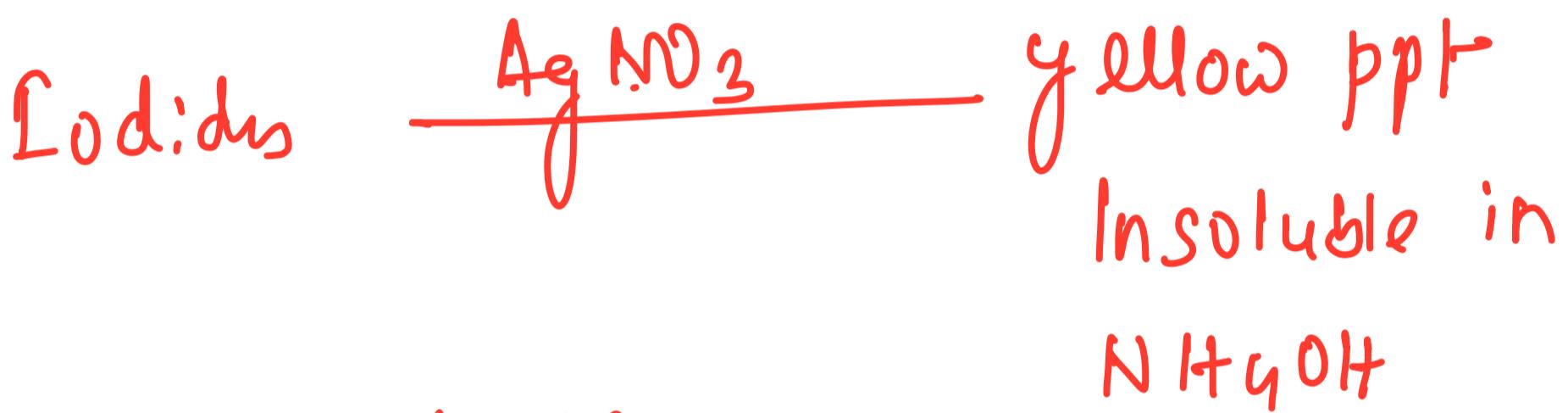
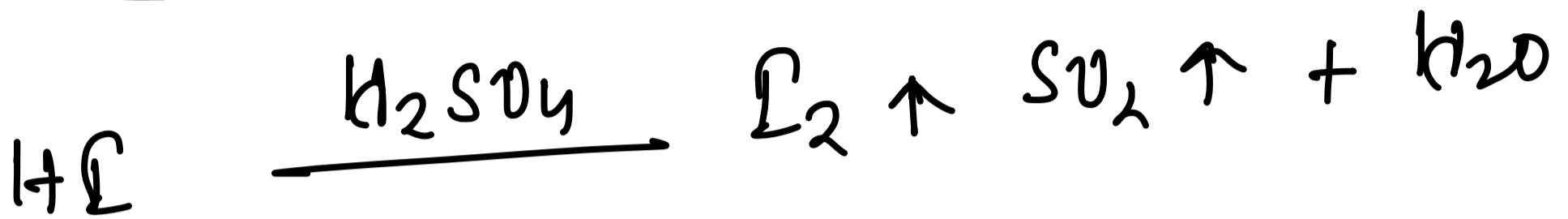
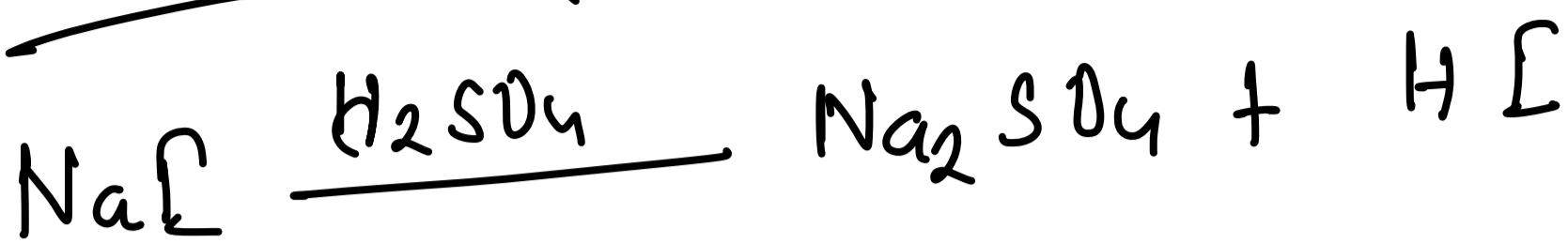
Bromide ( $\text{Br}^-$ ) Brown vapours



## ii) Bromides



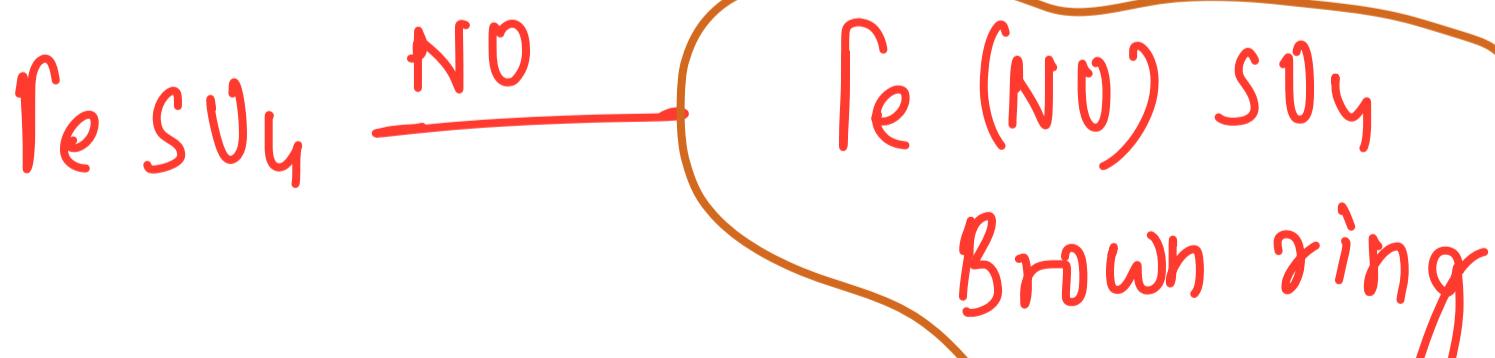
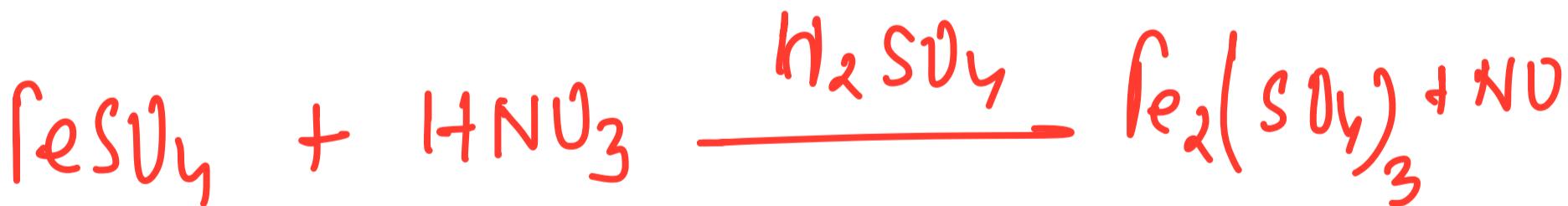
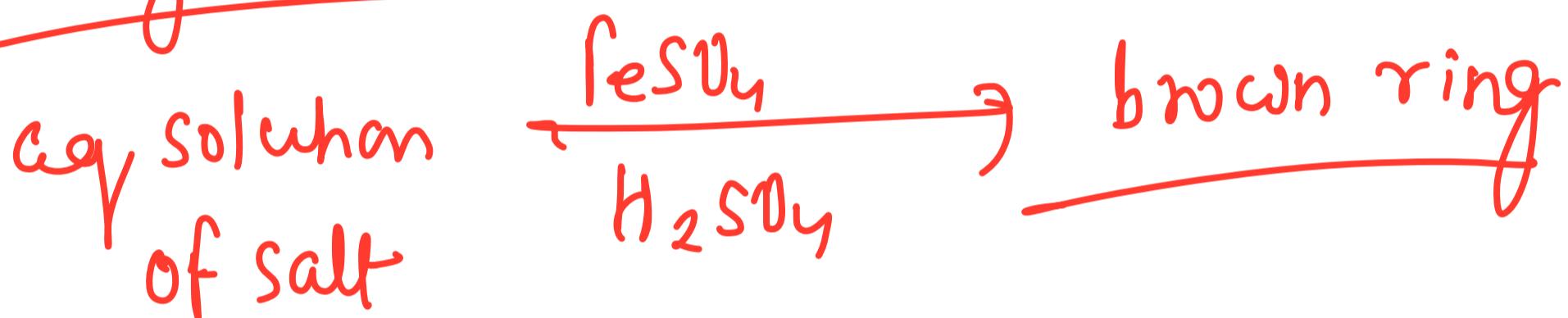
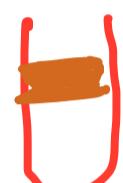
Iodide (Dark violet fumes)



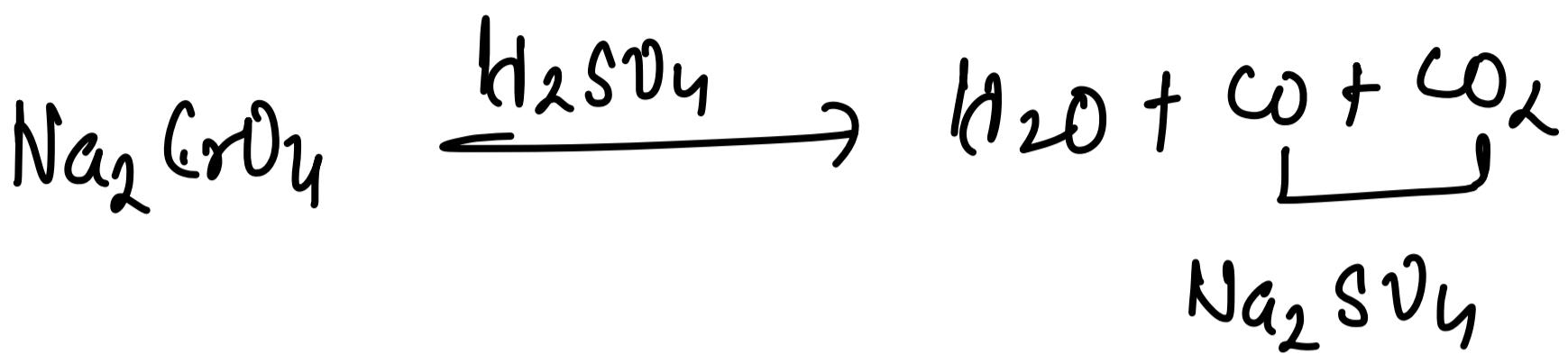
Nitrati ( $\text{NO}_3^-$ ) Brown fumes



### Ring Test of Nitrati

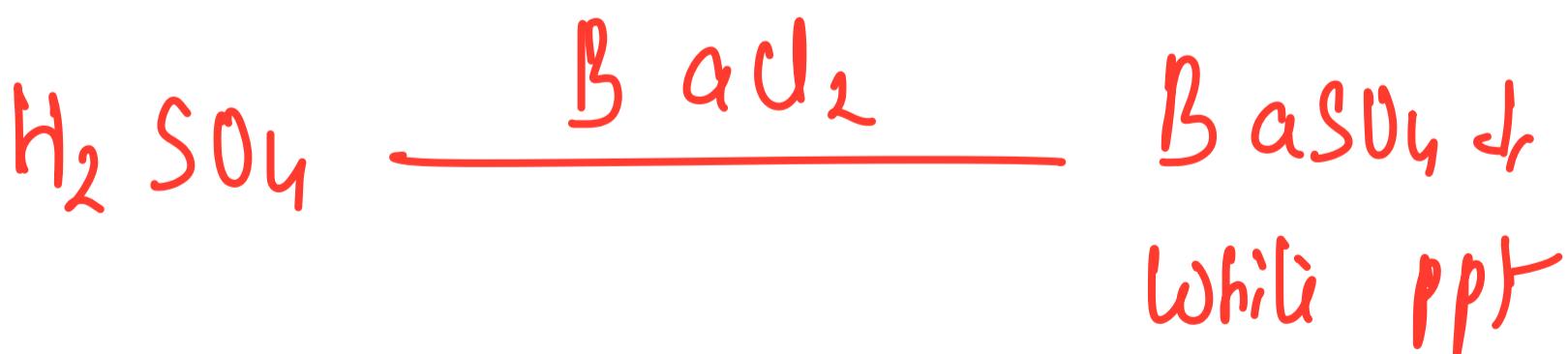
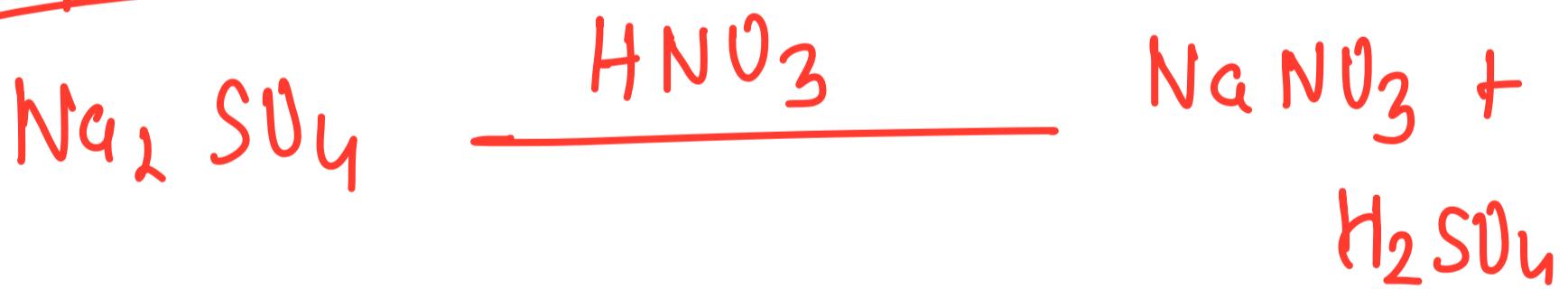


Oxalali : colourless gas ( $\text{CO} + \text{CO}_2$ )



gases at the mouth of test tube burns with blue flame

Sulphali :

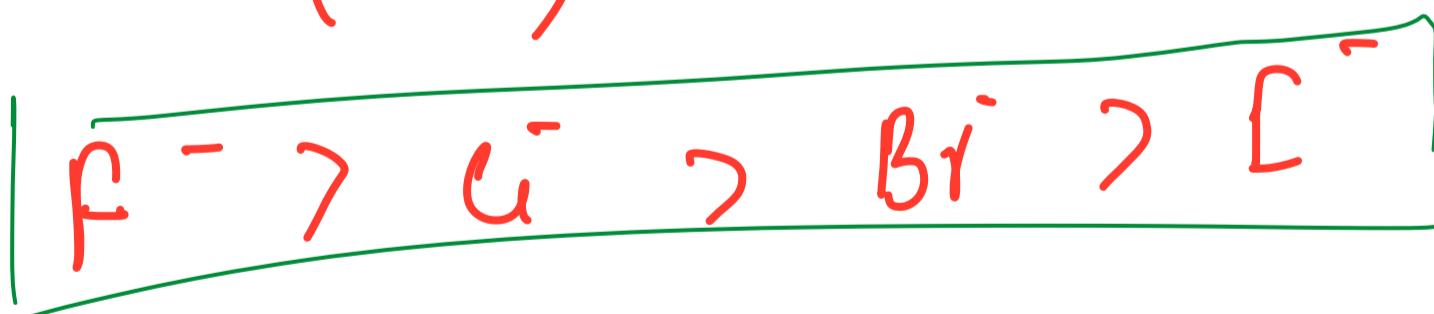


## Solubility of Salt -

- 1) Nitrates & Nitriles of all Metals  
are water soluble
- 2) All Sulphates Except (Pb, Ba, Sr)  
are water soluble

$\text{CaSO}_4$  is slightly soluble in water

- 3) halides of Ag, Pb, Hg(ous)  
& Cu(ous) are Insoluble



- 4)  $\text{CaF}_2$  is Insoluble while other  
halides of Ca are soluble

$\text{CaF}_2$ ,  $\text{BaSV}_4$ ,  $\text{SrSO}_4$ ,  $\text{Sb}_2\text{O}_3$ , { White }

$\text{Al}_2\text{O}_3$ ,  $\text{SnO}_2$ ,  $\text{SiO}_2$ ,  $\text{AgCl}$

$\text{PbSO}_4$

$\text{HgS}$

→ Black

$\text{Fe}_2\text{O}_3$

→ Red

$\text{PbCrO}_4$ ,  $\text{AgBr}$ ,  $\text{AgI}$  → yellow

$\text{Cr}_2\text{O}_3$

$\text{Cr}_2(\text{SO}_4)_3$  → green

$\text{CrCl}_3$

→

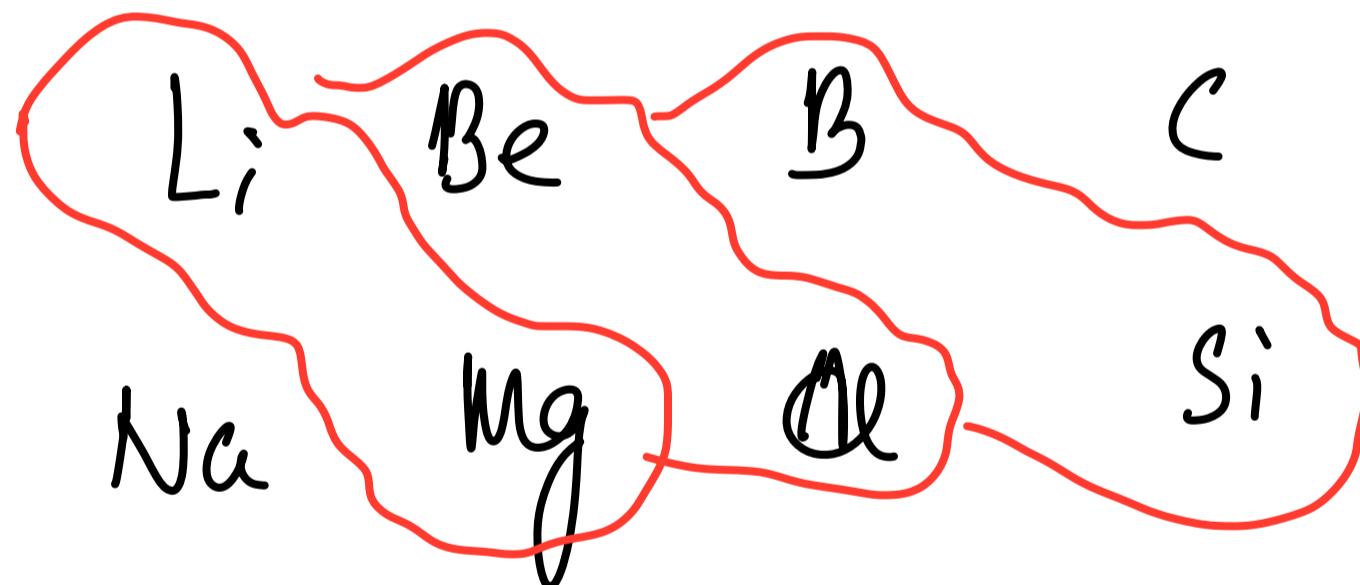
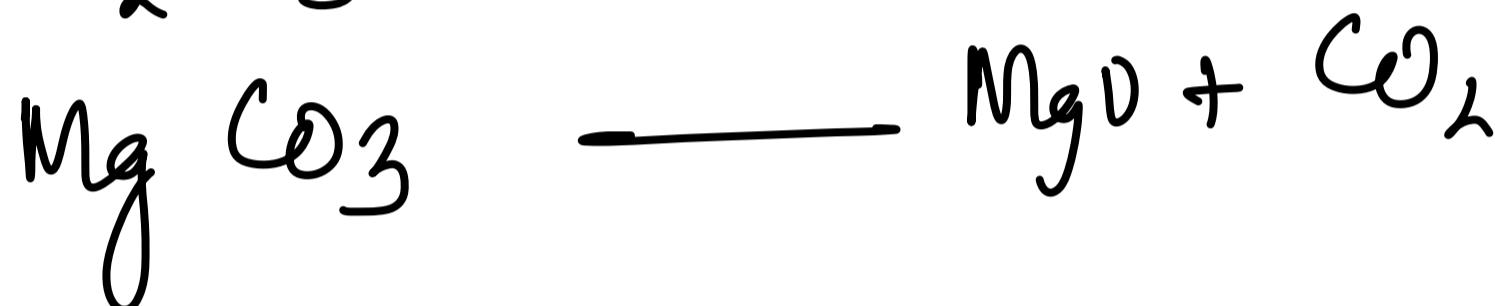
Violet

# Action of heat

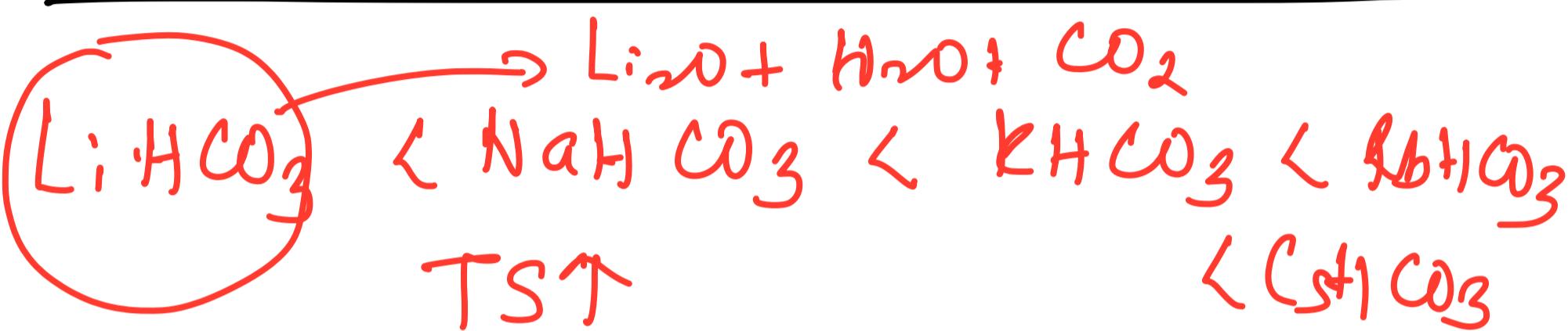
---

all Carbonates Except (Na, K, Rb, Cs)

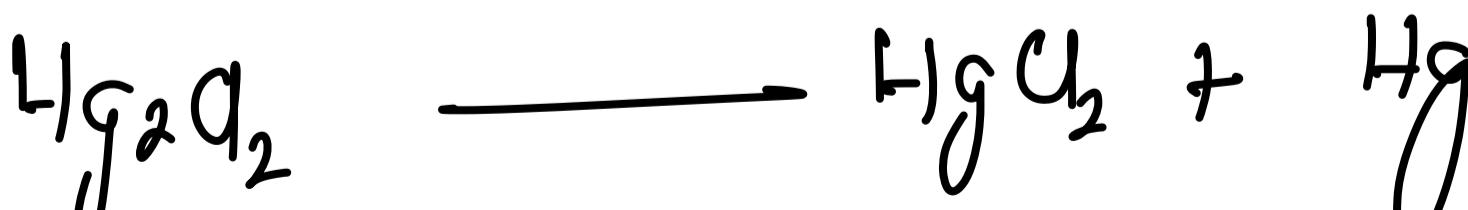
decomposes to give  $\text{CO}_2$



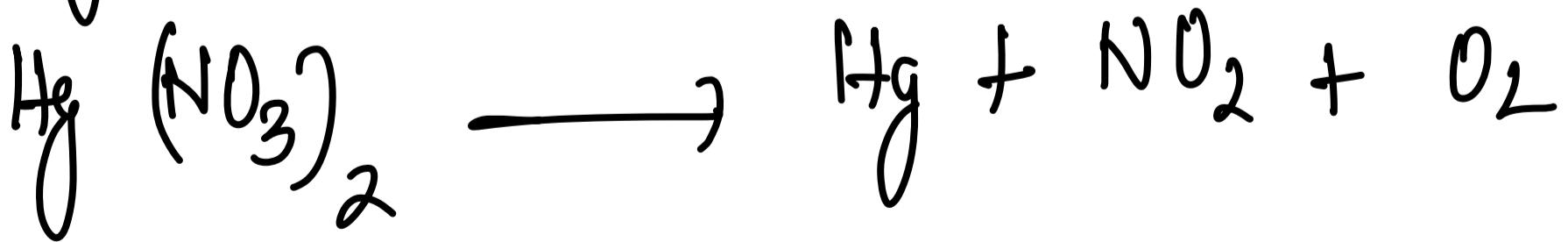
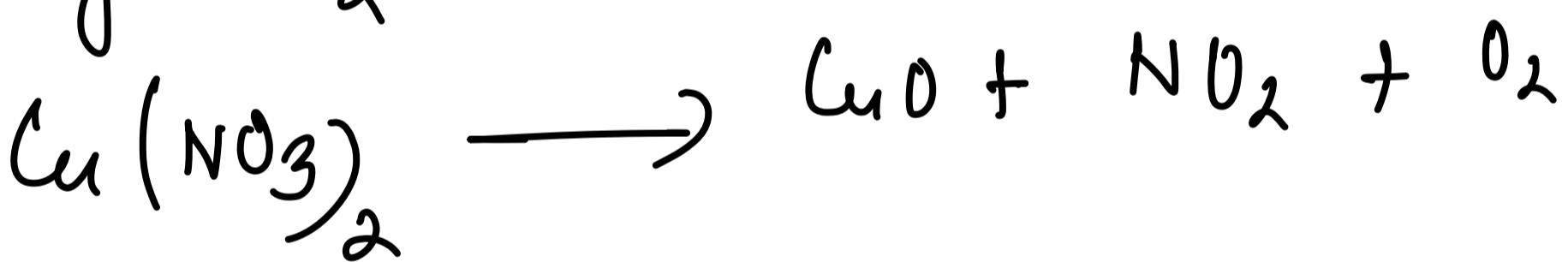
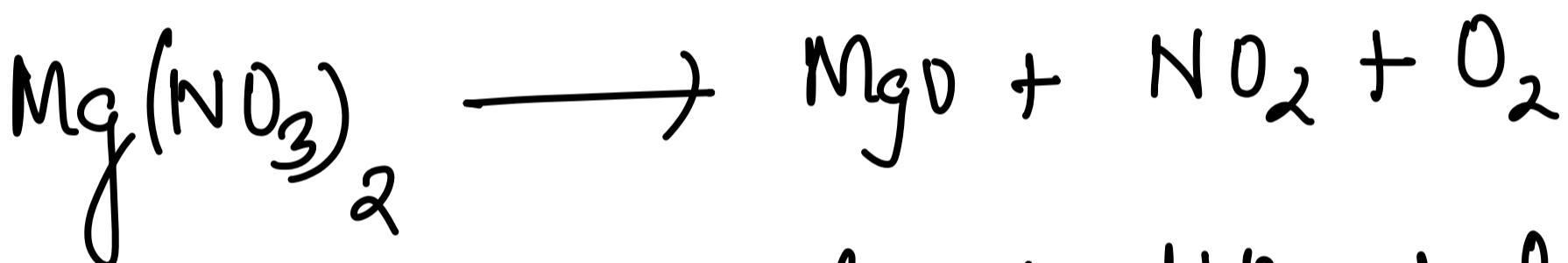
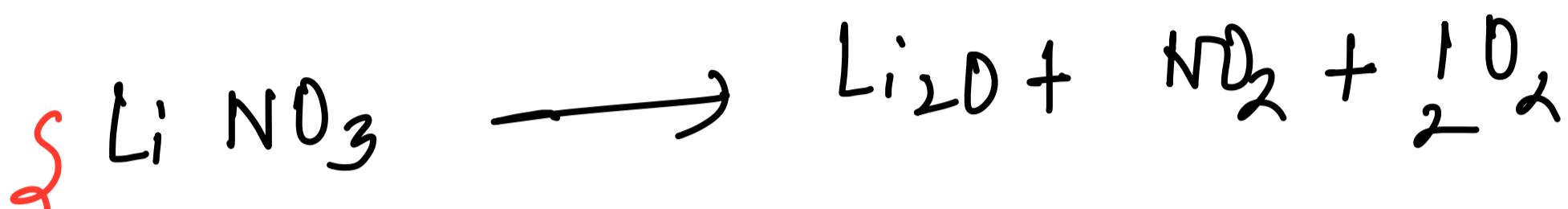
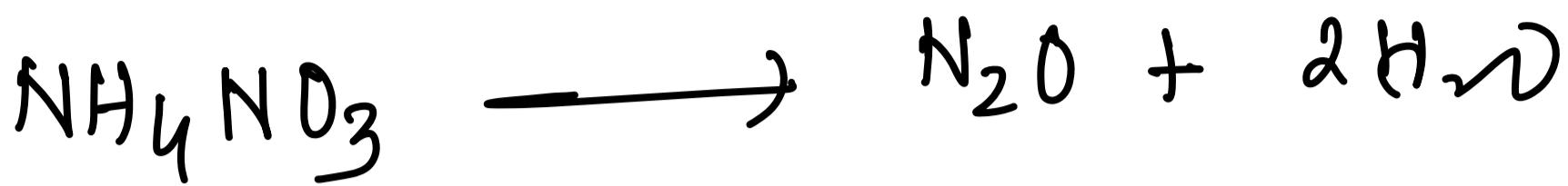
2) all bicarbonates decomposes to give **Carbonates and  $\text{CO}_2$**



3) halides normally stable to heat  
some halides decomposes



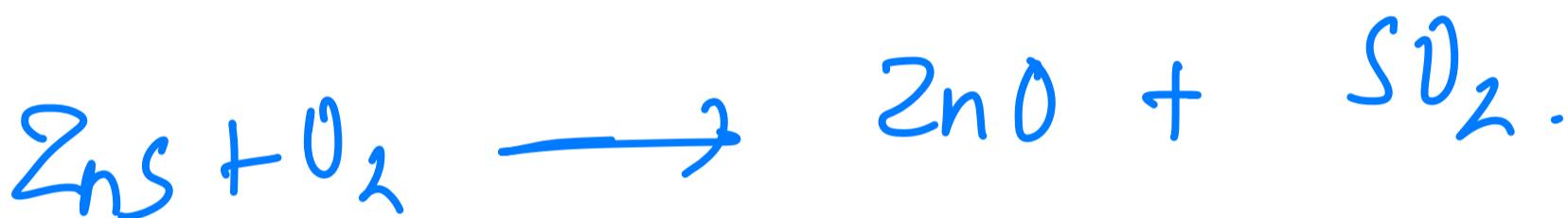
Nitrates: decompose On heating



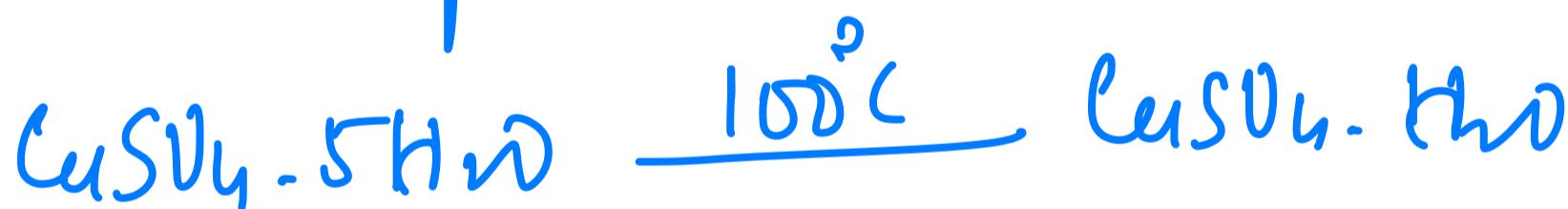
Silver Salt On heating gives Ag



Metal Sulphide  $\xrightarrow{\Delta}$  Metal Oxide + SO<sub>2</sub>↑

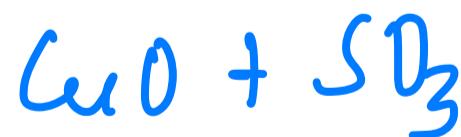


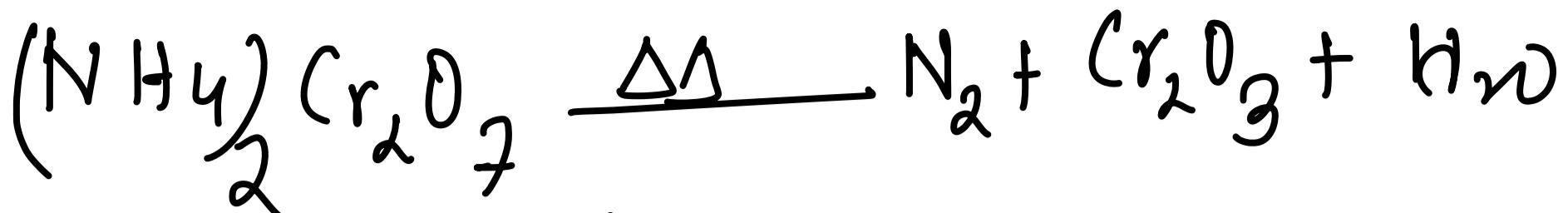
Metal Sulphate  $\xrightarrow{\Delta}$  Metal Oxide



(Blue Vitriol)

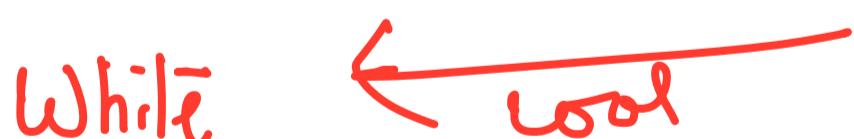
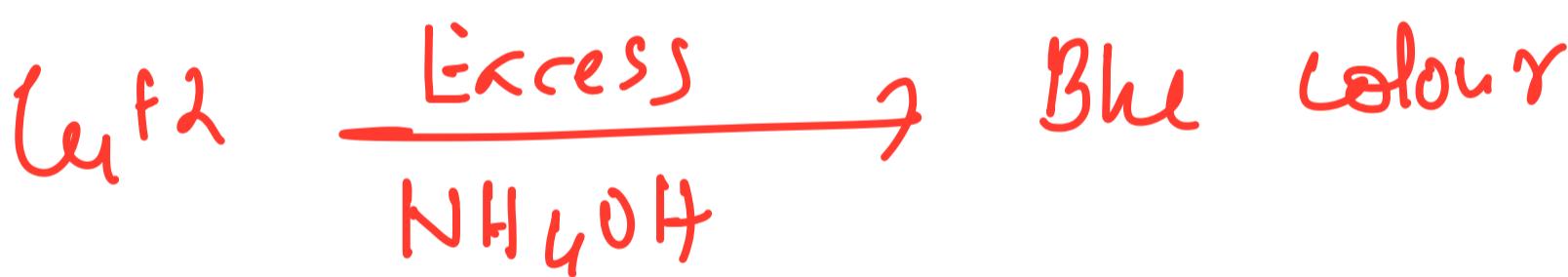
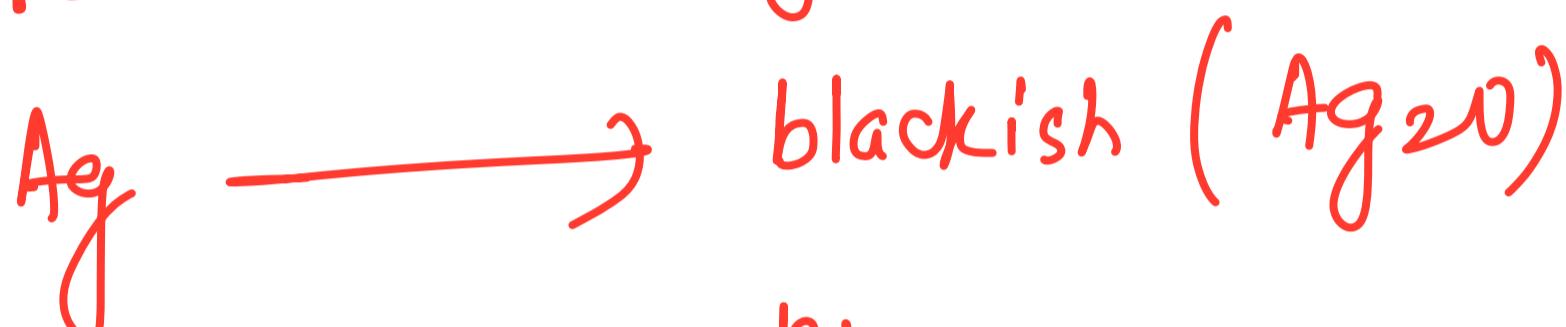
$\downarrow$  300°C

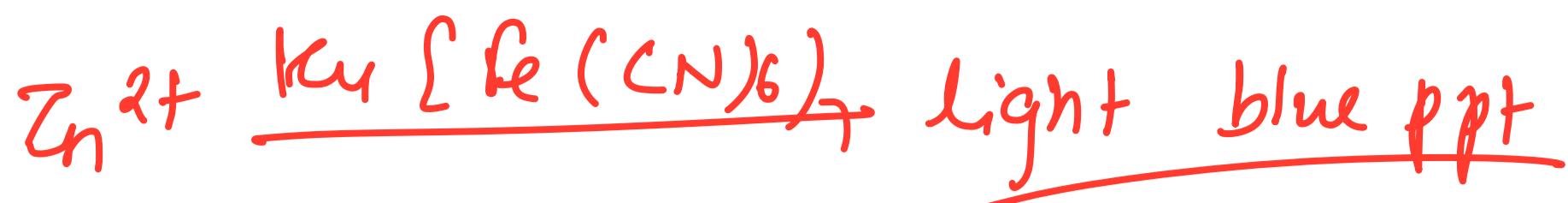




Intra molecular

flame colour s





Ba → apple green

Sr → crimson red

Ce → brick red

Na → golden yellow

K → pink