

LAKSHYA



JEE 2024



- 
- Subject Name-Inorganic Chemistry

- 
- Chapter Name-Salt Analysis



Lecture No. - 08

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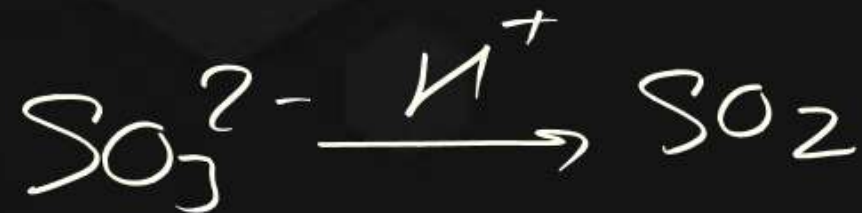
Today's Targets

1

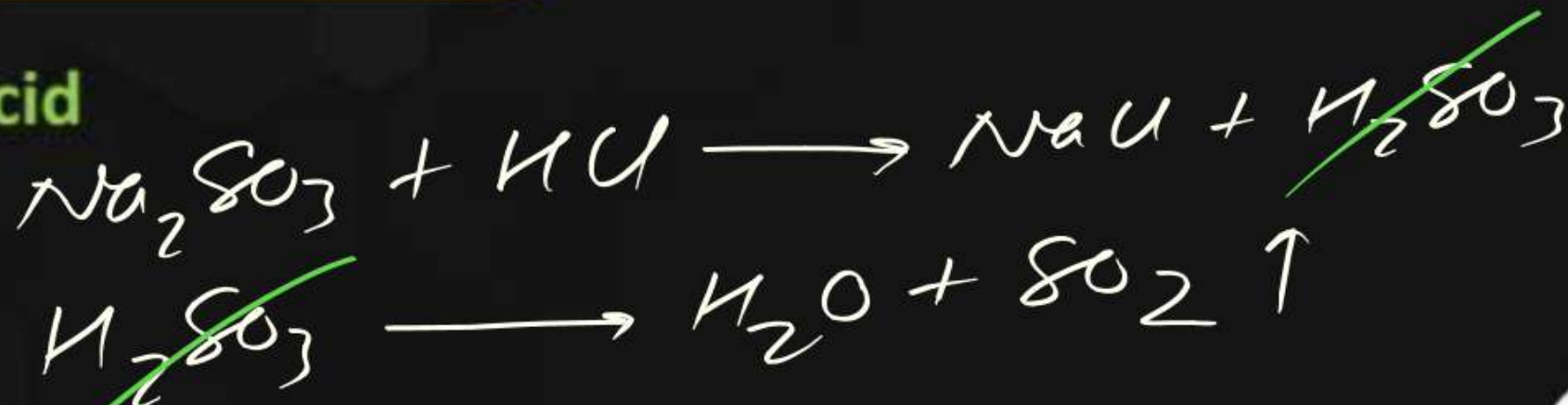
Test of Anions (Part -03)



Sulphite (SO_3^{2-}) :



Test with Acid



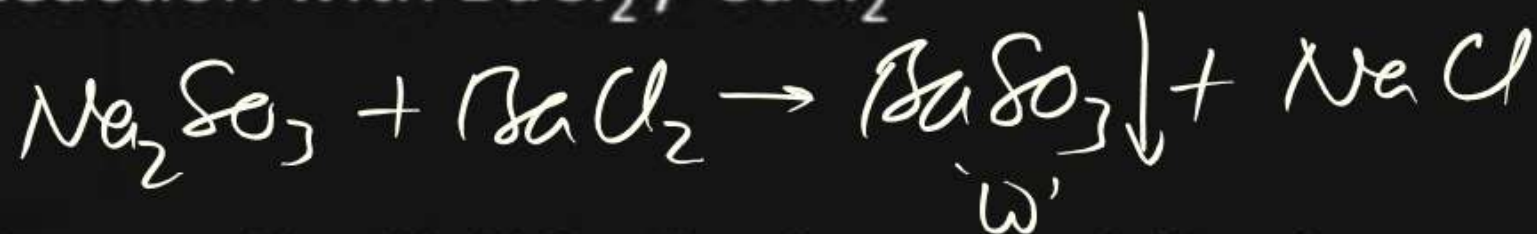
Properties of SO_2

Suffocating smell of burning Sulphur

Act as O.A./R.A.

Ppt reaction

(1) Reaction with BaCl_2 / CaCl_2



Q.S.P. On standing BaSO_3 slowly gets oxidised on reaction with atoms O_2

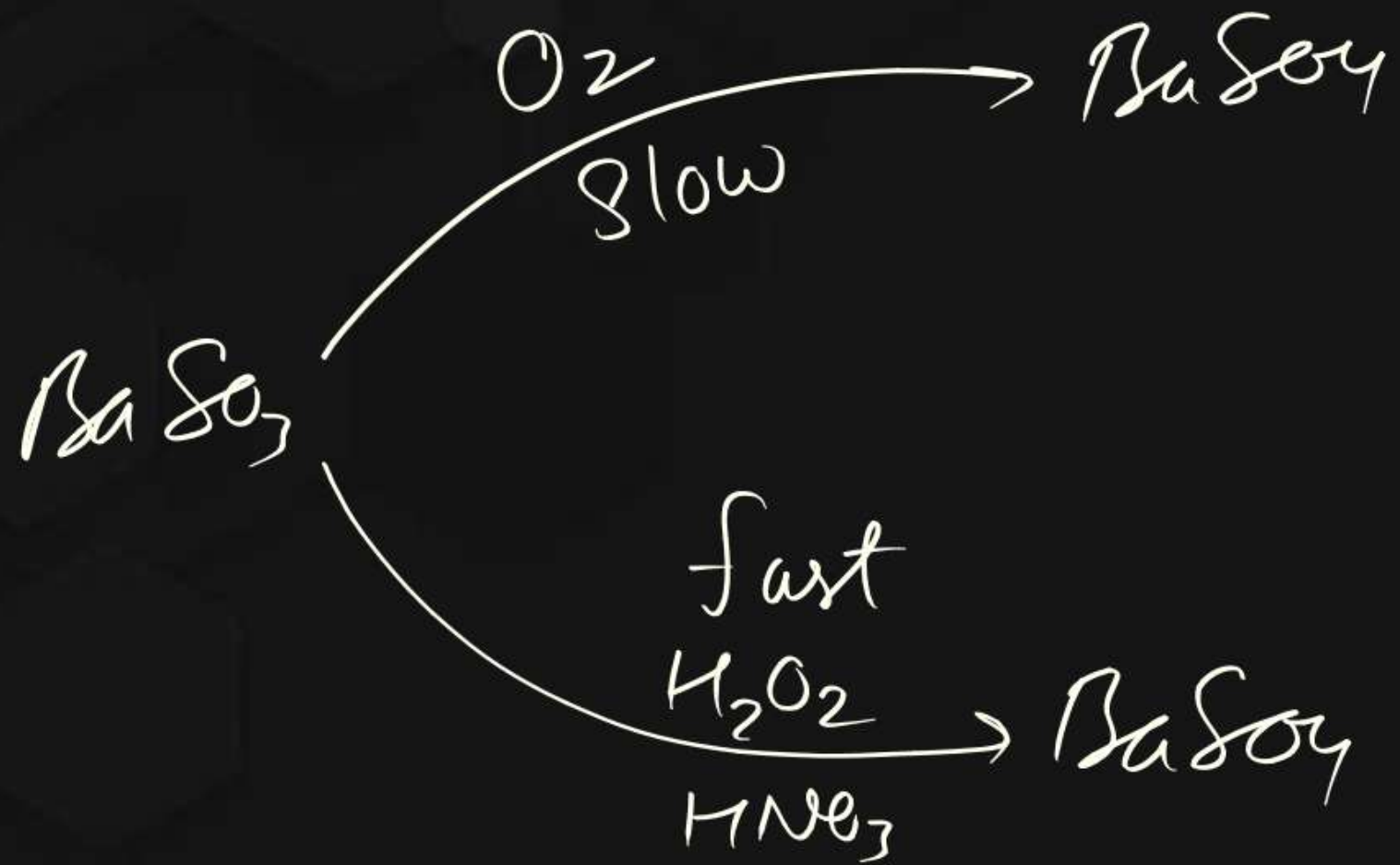


Same reaction with $\text{Br}_2 + \text{H}_2\text{O}$, HNO_3 , H_2O_2

★ due to high 'U'

BaSO_4 is soluble in acid and base, except hot and concentrated H_2SO_4

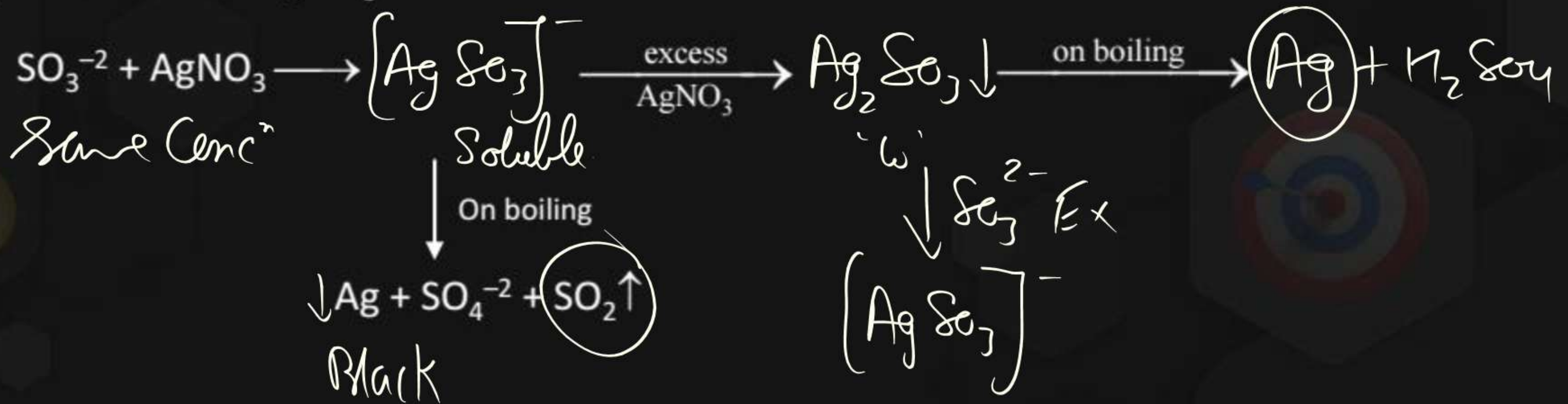
Q.S.P.



(2) Reaction with $\text{Pb}(\text{NO}_3)_2$



(3) Reaction with AgNO_3



Question



Which of the following statement is correct for above the reaction.

A

First no visible change colors because the formation of sulphitoargentite ion.

B

On the addition of more reagent, a white crystallize ppt of silver sulphite is formed.

C

The ppt dissolves if SO_3^{2-} ions are added in excess.

D

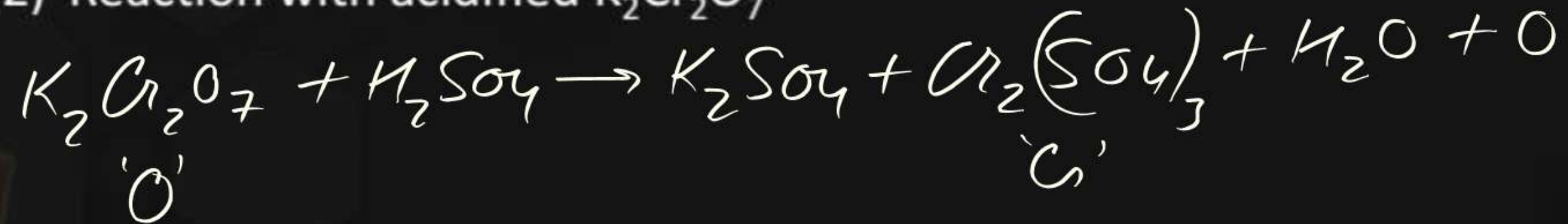
On boiling the solution of complex salt or aqueous suspension of ppt, grey metallic Ag is precipitated.

Test with oxidizing agent

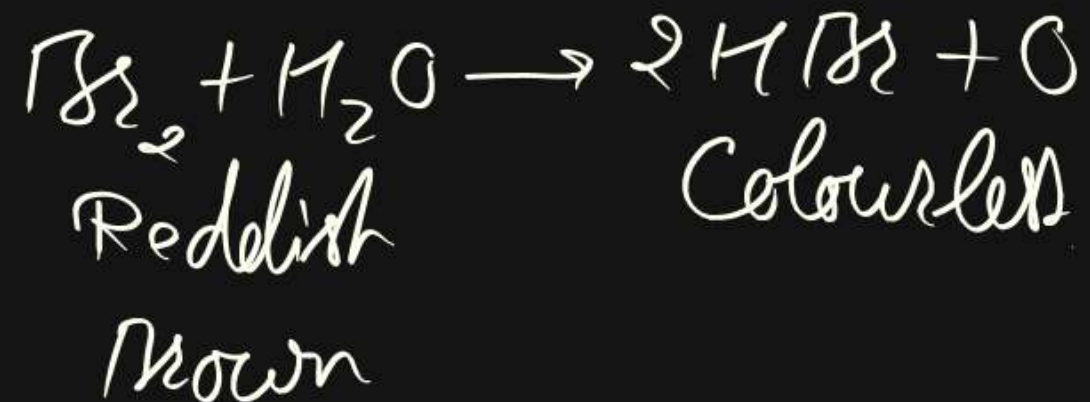
(1) Reaction with acidified KMnO_4



(2) Reaction with acidified $\text{K}_2\text{Cr}_2\text{O}_7$



(3) Reaction with bromine water



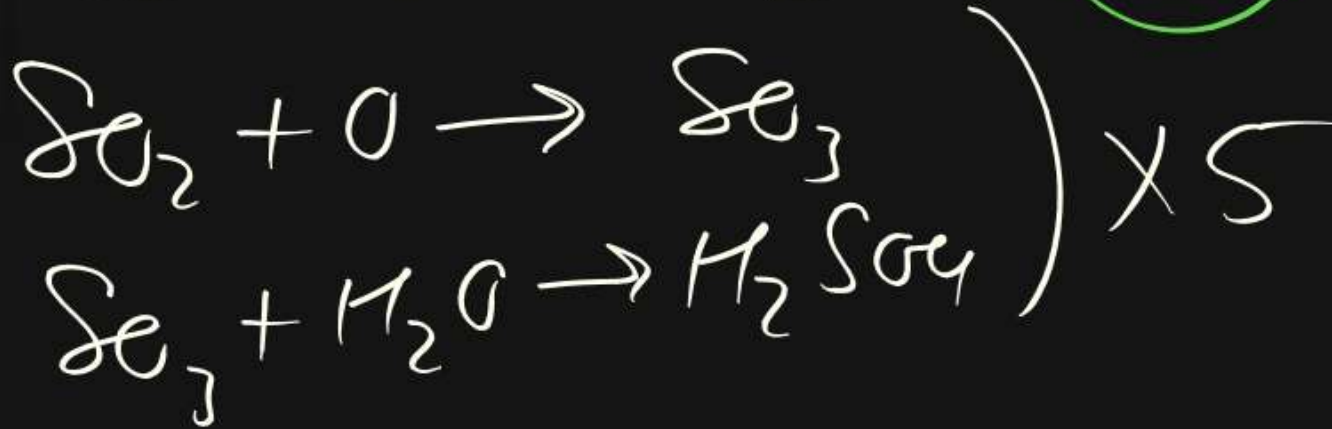
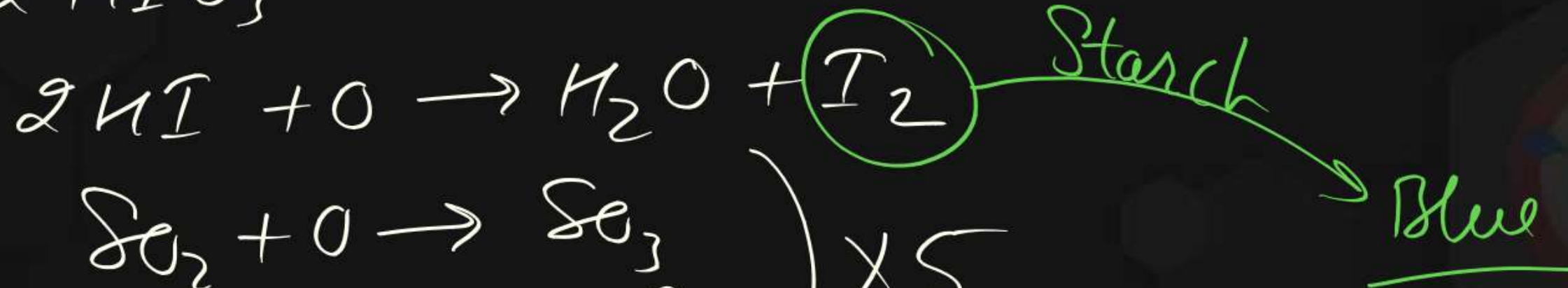
R.B.C



(4) Reaction with FeCl_3



(5) Reaction with acidify KIO_3



Test with reducing agent



(1) Reaction with Zn + dil H_2SO_4



R.B.C



lowest O.S
 H_2S

(2) Reaction with Devarda's alloy (Cu 50%, Al 45%, Zn 5%)

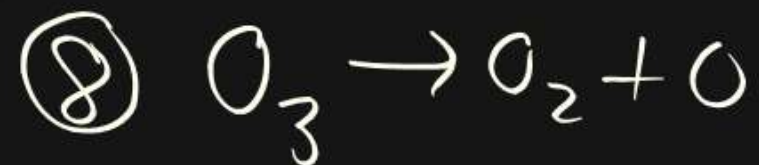
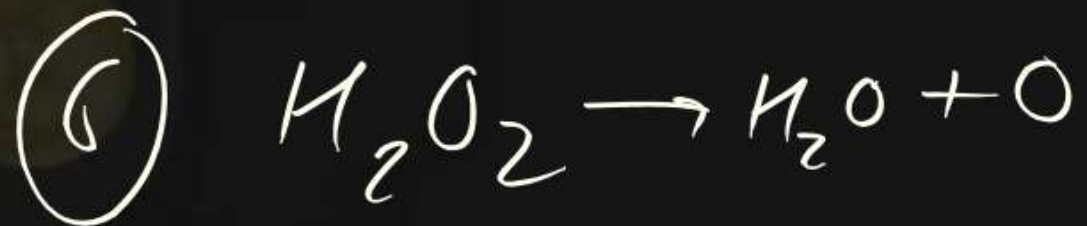
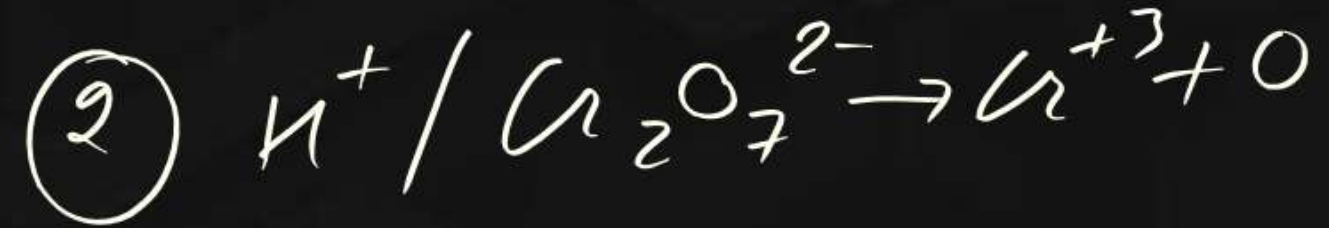


Ans



used as reducing agent

Q.S.P.



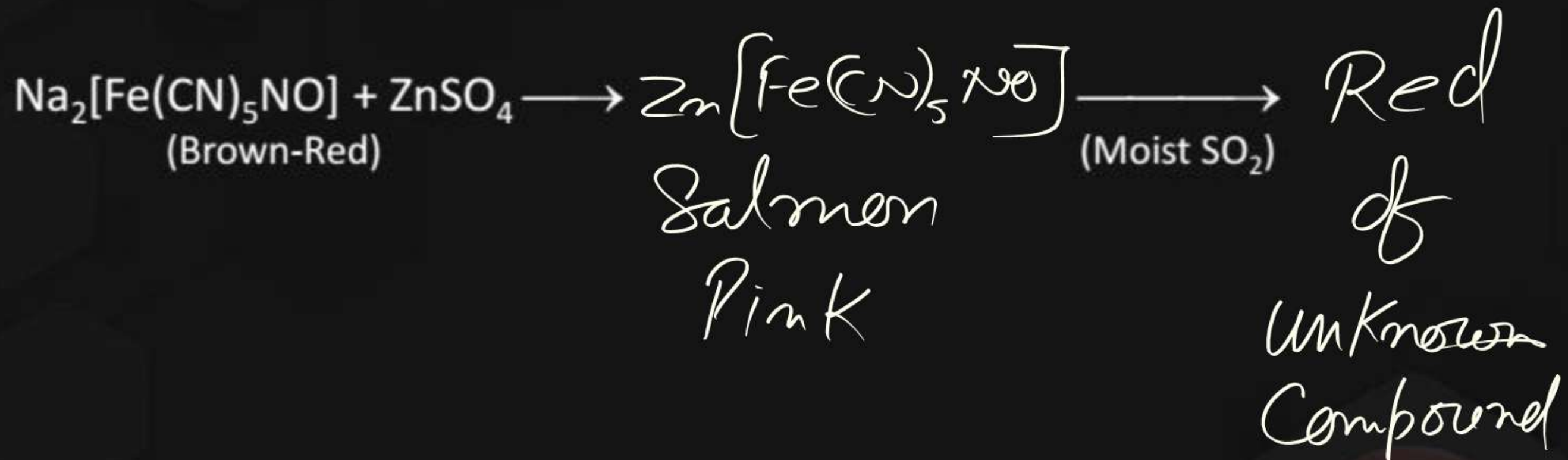
Q.S.P

Specific Test

for SO_2



Test with Zinc nitroprusside





Bisulphite (HSO_3^{2-}) :



Test with Acid



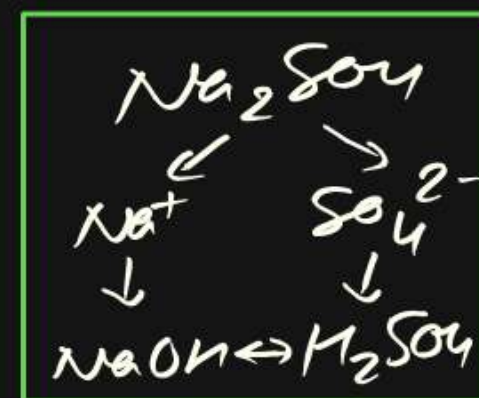
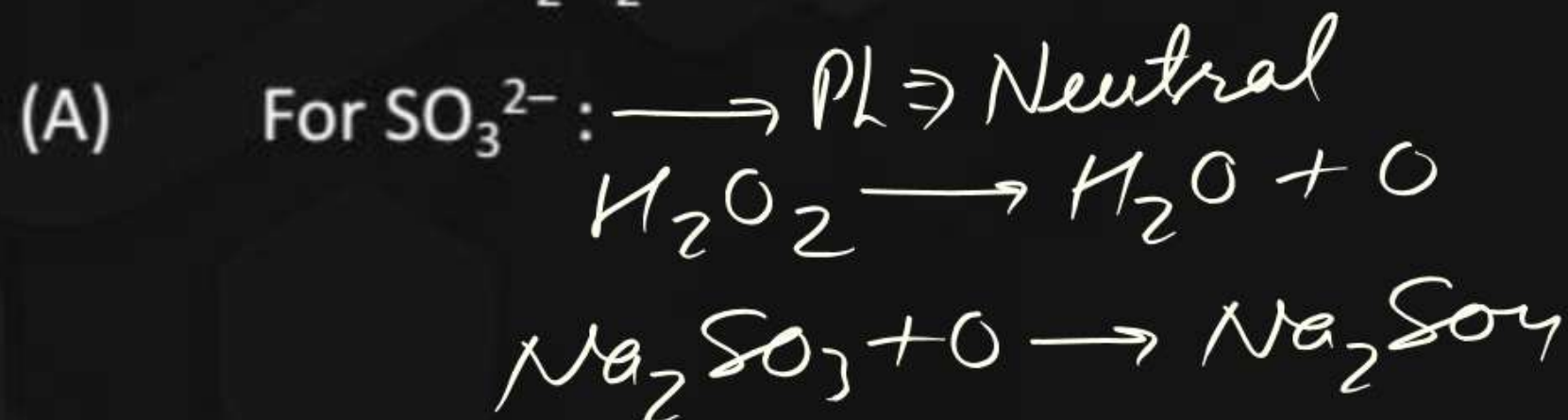
Properties of SO_2

Suffocating smell of burning Sulphur

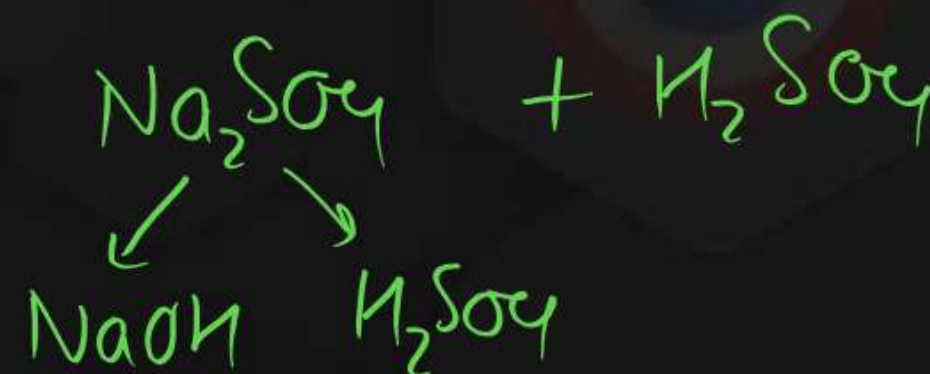
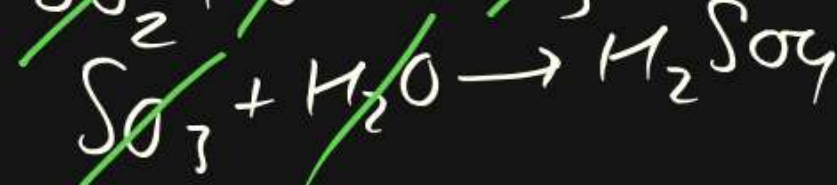
Distinction in between HSO_3^- / SO_3^{2-}



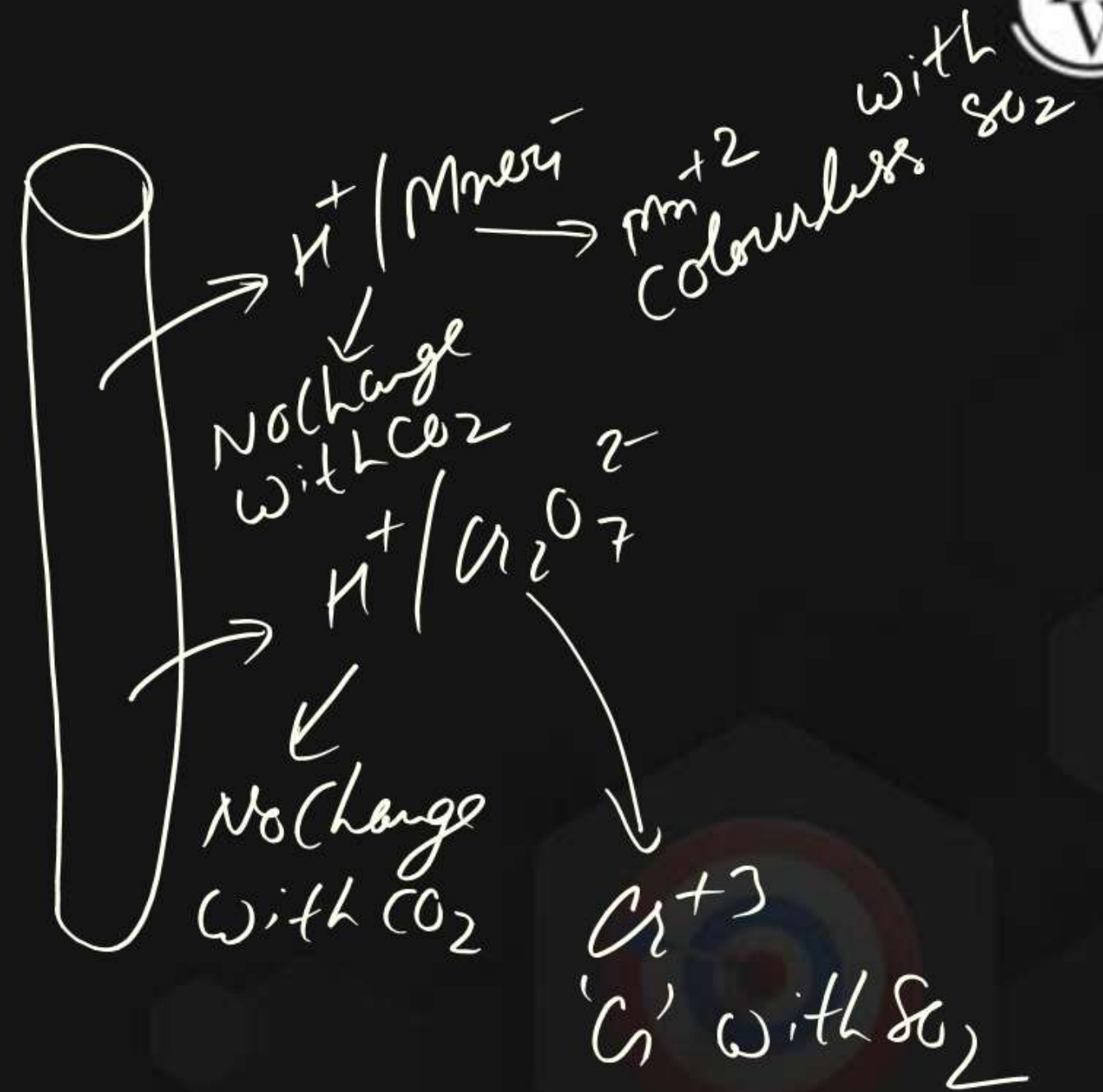
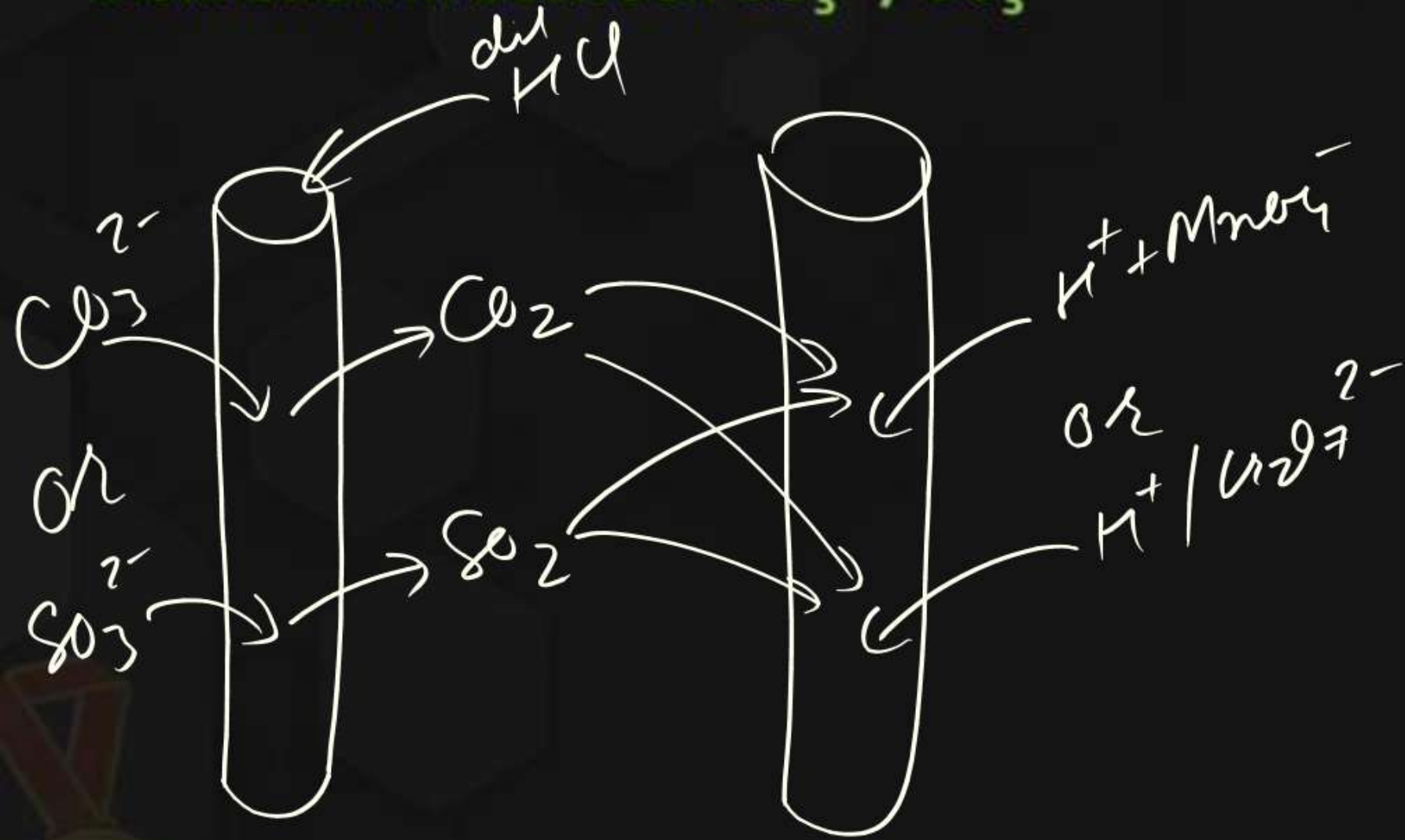
Reaction with H_2O_2



pH $\rightarrow$ Acidic



Distinction in between CO_3^{2-} / SO_3^{2-}





Sulphide :



Test with Acid



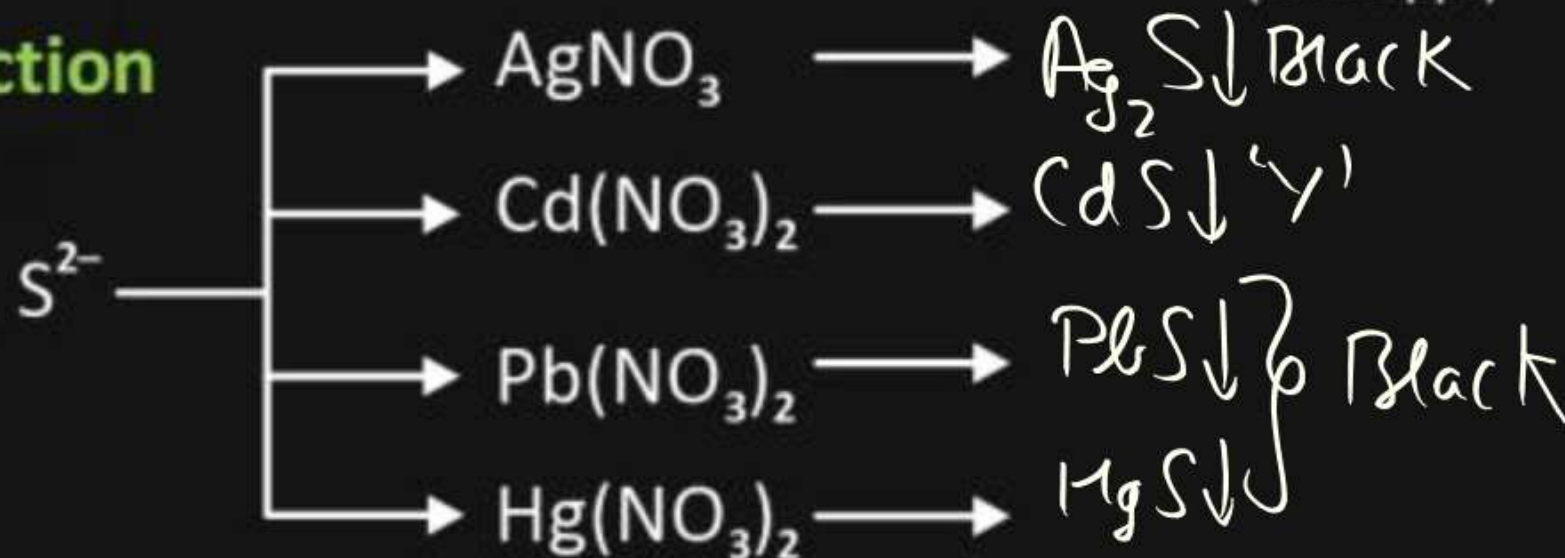
Properties of H_2S

Rotten egg smell, gives blue colour to flame / Act as R.A

Note: Some sulphide salts like Cr^{+3} , Al^{+3} , Mg^{+2} are readily hydrolysed.



Ppt Reaction



Test with oxidizing agent



(1) Reaction with Acidify KMnO_4



(2) Reaction with Acidify $\text{K}_2\text{Cr}_2\text{O}_7$

(3) Reaction with bromine water

(4) Reaction with FeCl_3

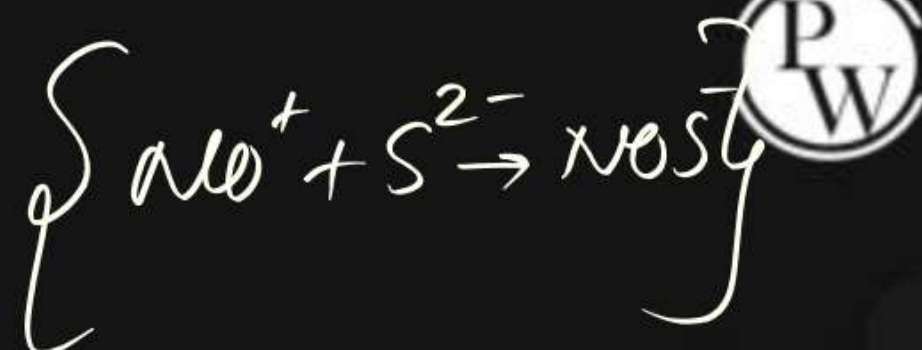
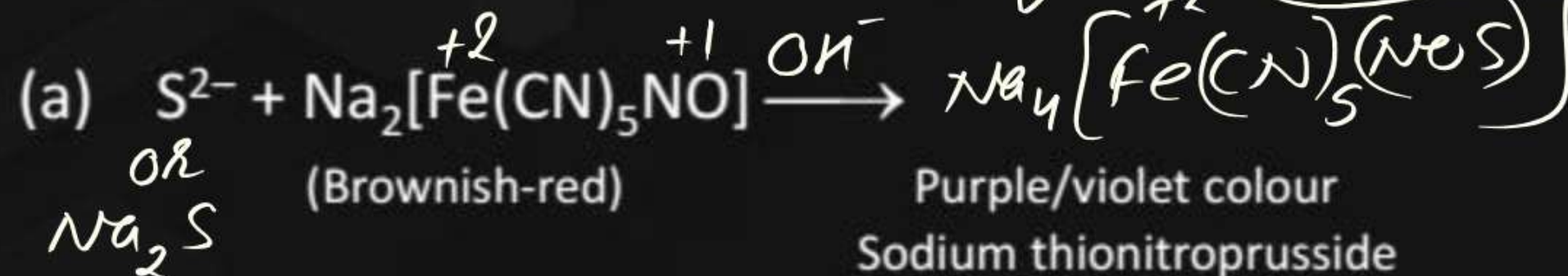


(5) Reaction with acidify KIO_3



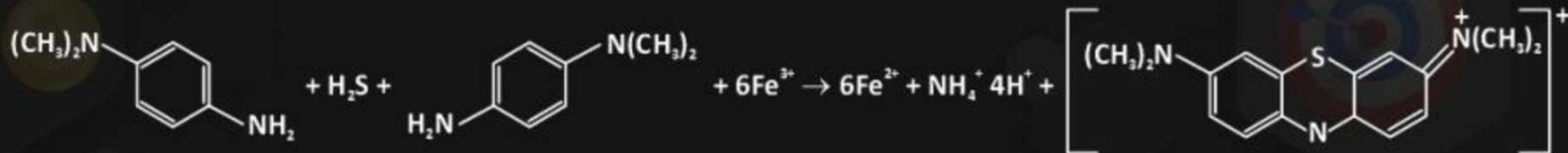
Other Reactions

(1) Test with sodium nitroprusside:

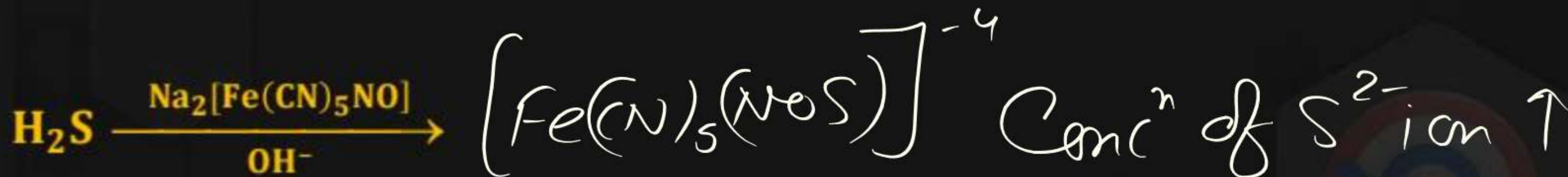
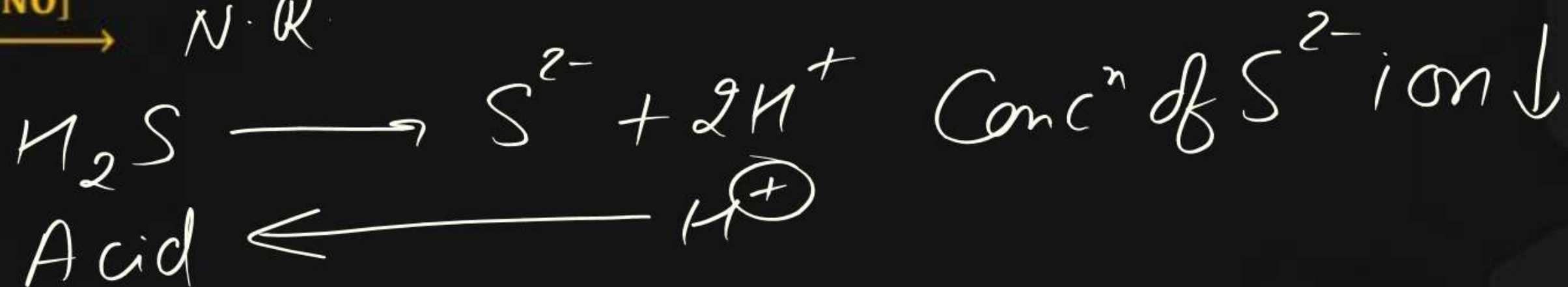
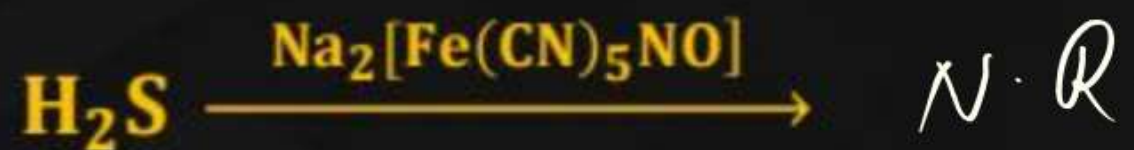


(2) Test with para amino dimethyl aniline: I B I

p-amino dimethylaniline is converted into the water soluble dye stuff methylene Blue by reacting with $FeCl_3$ and H_2S in strongly acid solution.



Which of the following reaction is possible :



(3) Catalytic Azide test :

Physical appearance of compound :

Colour of NaN_3 is : *Colourless*

Colour of KI_3 is : *Brown*

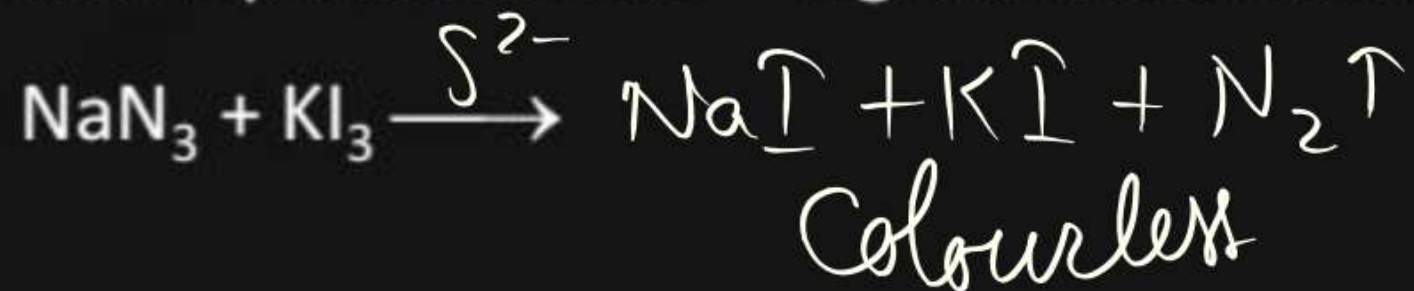
If NaN_3 is limiting reagent then colour of mixture is : *Brown*

If KI_3 is limiting reagent then colour of mixture is : *Yellow*

Reaction :



but in presence of S^{2-} it gives colourless solution.



Question



Catalytic Azide test is not a specific test of S^{2-} ion. Why ?



Confirmatory test :

We will be use $ZnCO_3$, $CdCO_3$

unknown salt + $ZnCO_3$ / $CdCO_3$

Ppt

Solution

present

S^{2-}

ZnS / CdS

CAT

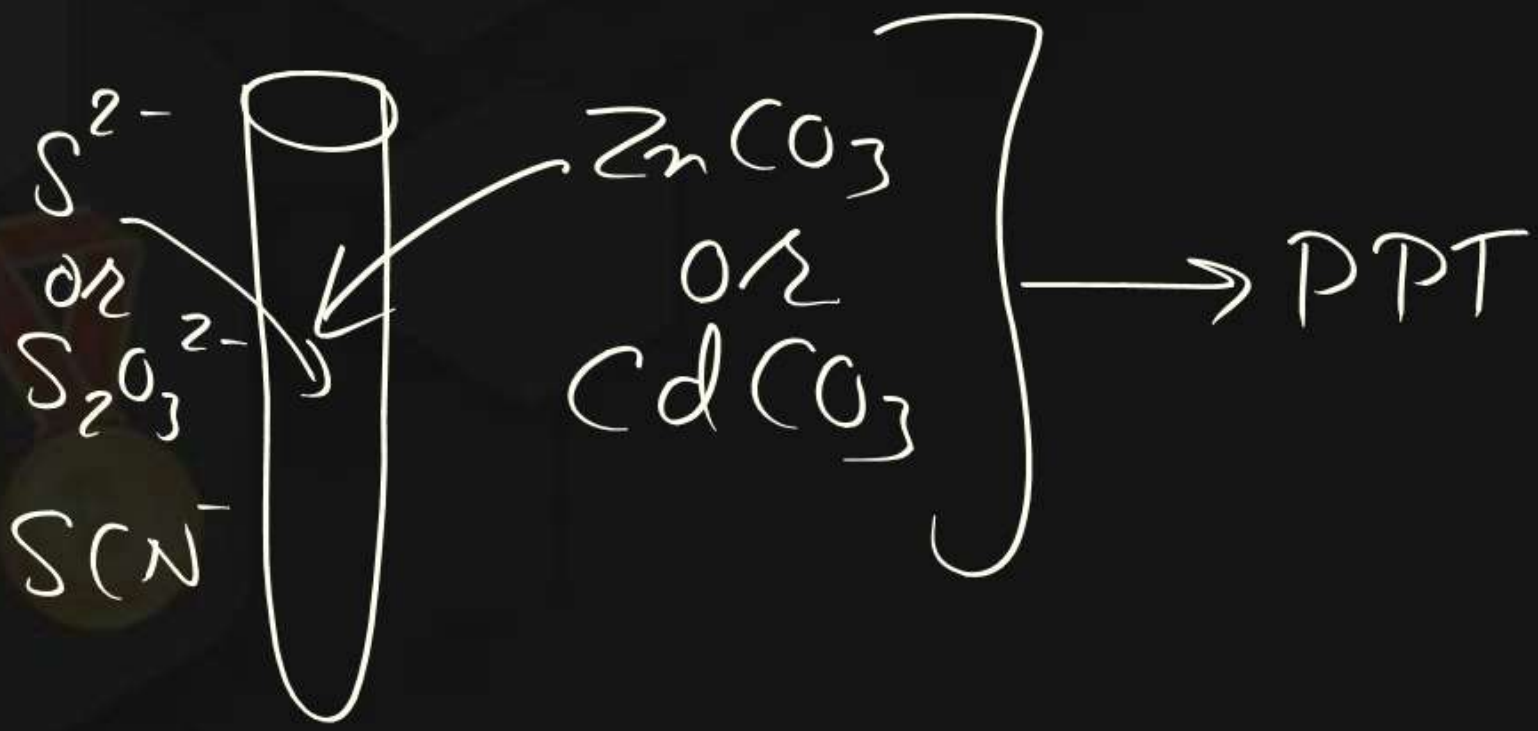
$\oplus$

absent

$ZnCO_3 / CdCO_3$

CAT

$\ominus$



$ZnCO_3$
 or
 $CdCO_3$

only react with S^{2-} ion
not with $S_2O_3^{2-} / SCN^-$

