

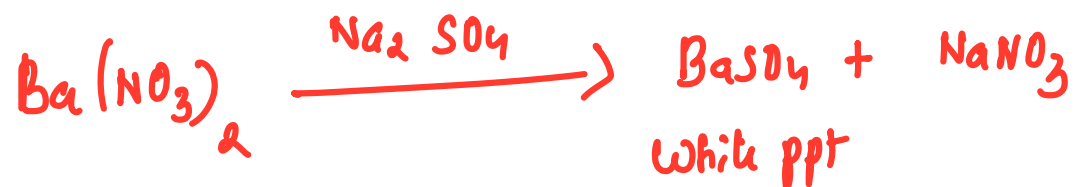
A doctor by mistake administers a $\text{Ba}(\text{NO}_3)_2$ solution to a patient for radiography investigations. Which of the following should be given as the best to prevent the absorption of soluble barium?

(a) NaCl

✓ (b) Na_2SO_4

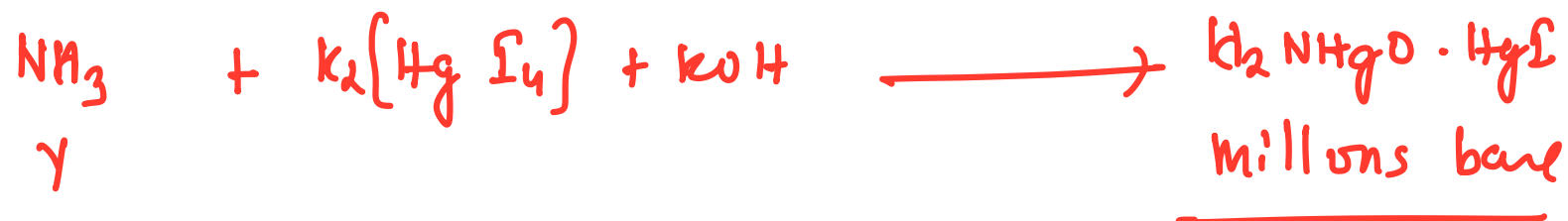
(c) Na_2CO_3

(d) NH_4Cl



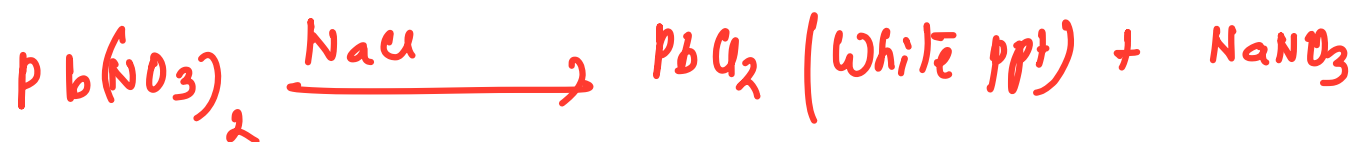
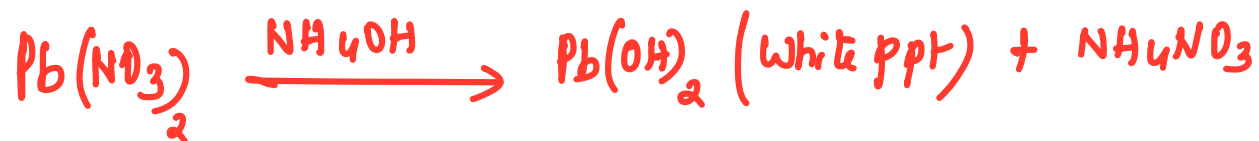
A colourless water soluble solid 'X' on heating gives equimolar quantities of Y and Z. Y gives dense white fumes HCl and Z does so with NH_3 . Y gives brown precipitate with Nessler's reagent and Z gives white precipitate with nitrates of Ag^+ , Pb^{2+} and Hg^+ . 'X' is:

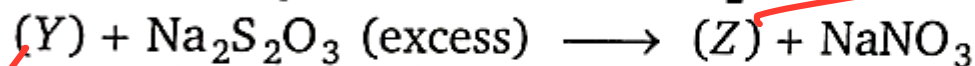
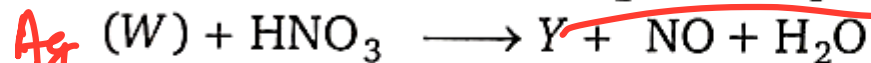
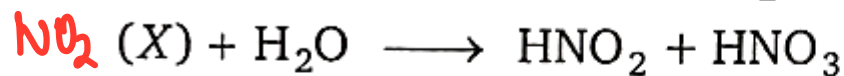
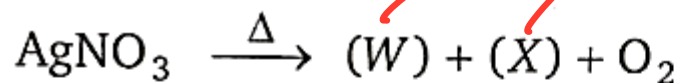
- (a) NH_4Cl (b) NH_4NO_3 (c) NH_4NO_2 (d) FeSO_4



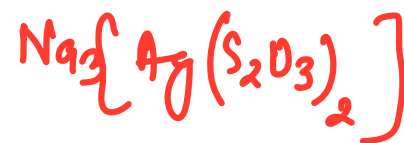
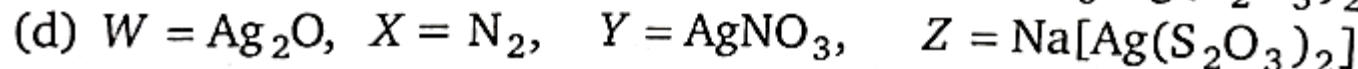
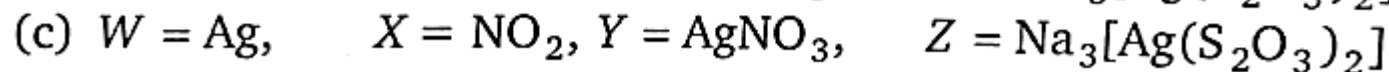
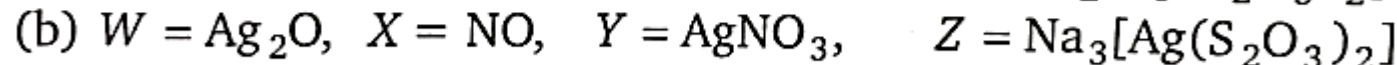
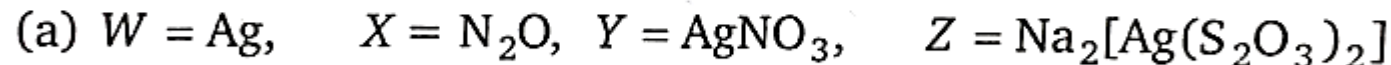
Three separate samples of a solution of a single salt gave these results. One formed a white precipitate with excess ammonia solution, one formed a white precipitate with dil. NaCl solution and one formed a black precipitate with H_2S . The salt could be:

- (a) $AgNO_3$ **(b) $Pb(NO_3)_2$** (c) $Hg(NO_3)_2$ (d) $MnSO_4$



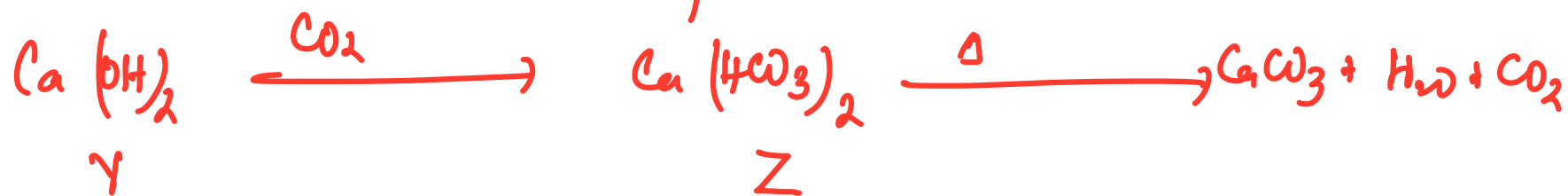
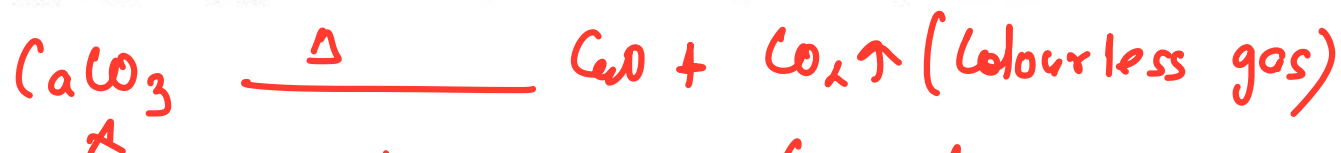


Identify (W) to (Z):



A compound 'X' on heating gives a colourless gas. The residue is dissolved in water to obtain 'Y'. Excess CO_2 is passed through aqueous solution of 'Y' when 'Z' is formed. 'Z' on gentle heating gives back 'X'. The compound 'X' is:

- (a) NaHCO_3 (b) Na_2CO_3
 (c) $\text{Ca}(\text{HCO}_3)_2$ (d) CaCO_3



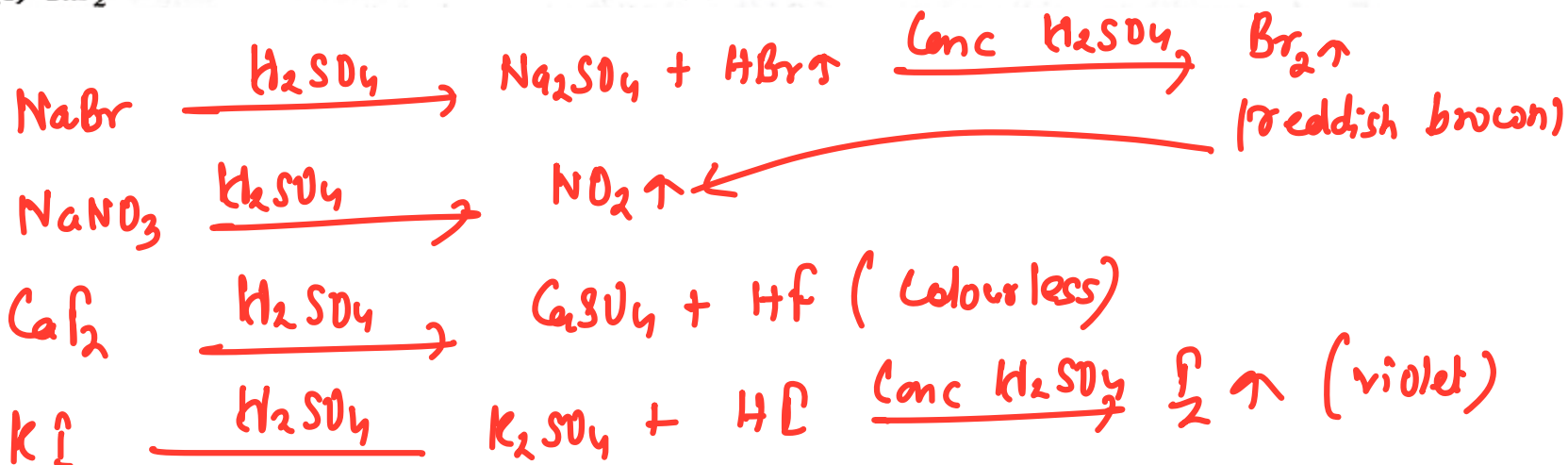
Which of the following salt on heating with concentrated H_2SO_4 , coloured vapours do not evolve ?

(a) NaBr

(b) NaNO_3

(c) CaF_2

(d) KI



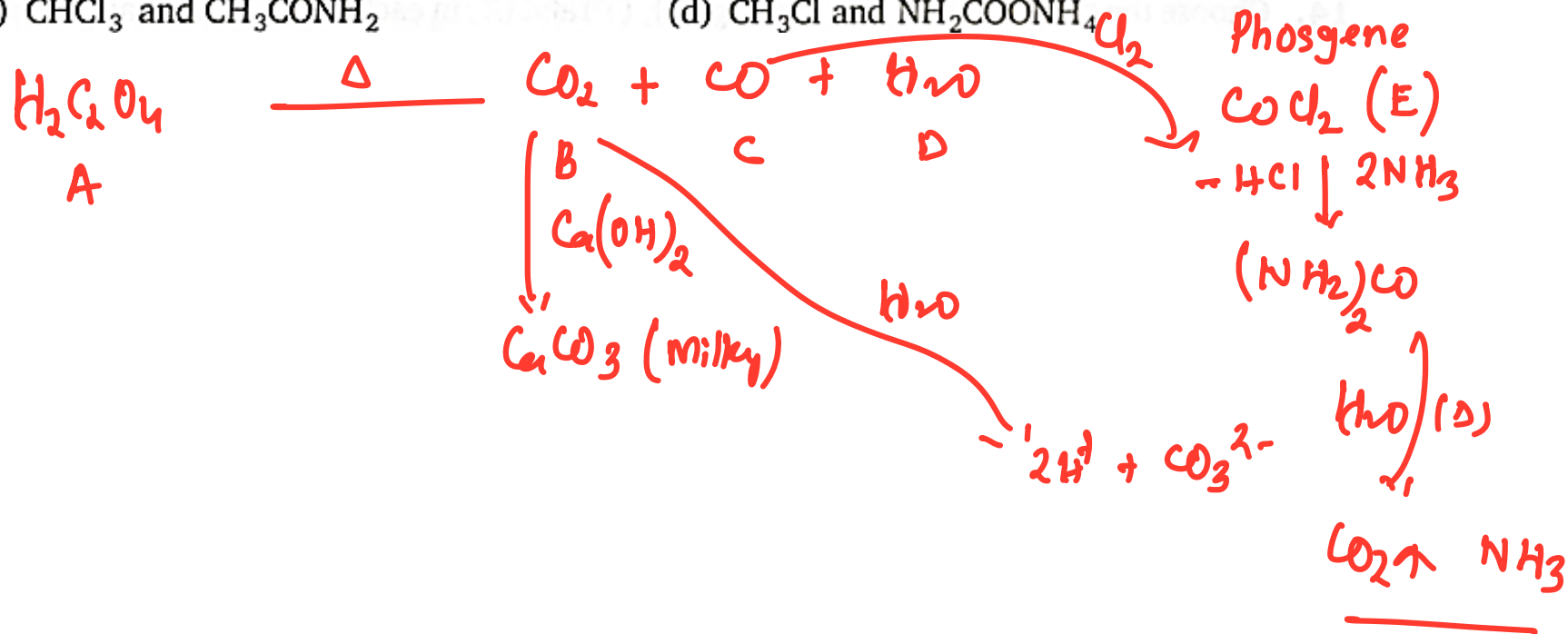
An organic compound (A) on heating produces two gases (B) and (C) and neutral oxide (D) which turns cobalt chloride paper pink. Gas (B) turns lime water milky and produces an acidic solution with water. Gas (C) produces a poisonous gas (E) with chlorine gas, this gas with ammonia gives an organic compound (F) which on further reaction with (D) gives NH_3 gas. Then, compounds (A) and (F) can be found as:

(a) $\text{H}_2\text{C}_2\text{O}_4$ and NH_2CONH_2

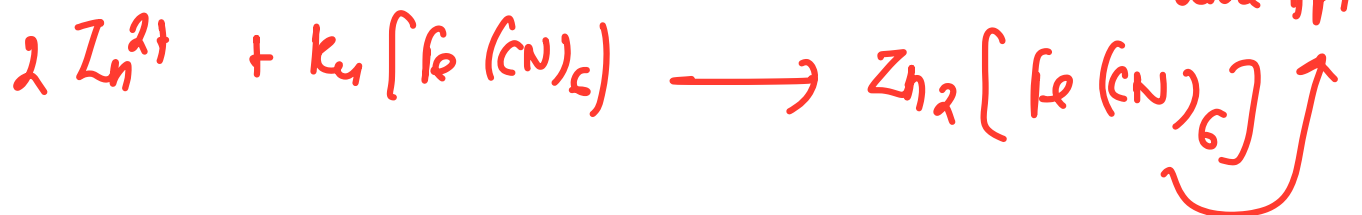
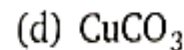
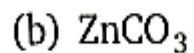
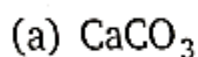
(b) CH_3COOH and NH_2CONH_2

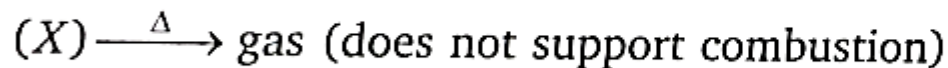
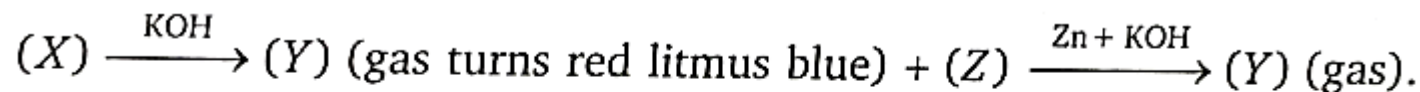
(c) CHCl_3 and CH_3CONH_2

(d) CH_3Cl and $\text{NH}_2\text{COONH}_4$



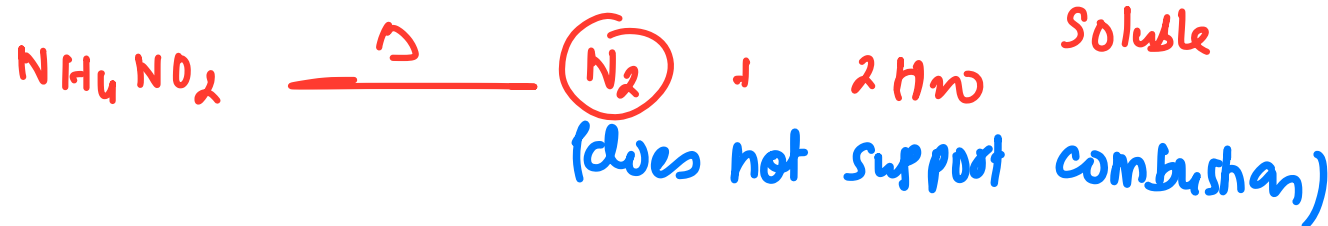
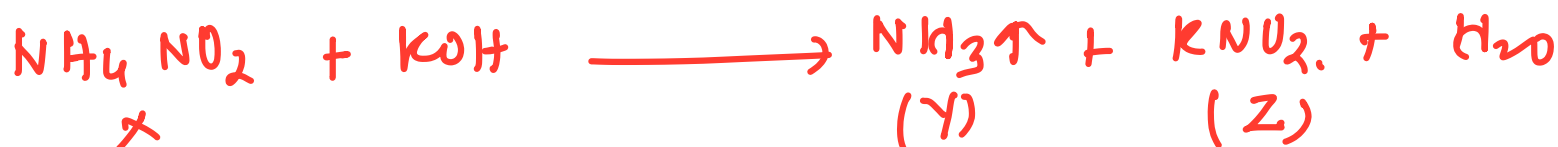
A white powder "A" on heating gave a non-combustible gas and a white residue. The residue on heating turns yellow. The residue dissolves in dil. HCl and the solution gives a white ppt. with $K_4[Fe(CN)_6]$. "A" would be:

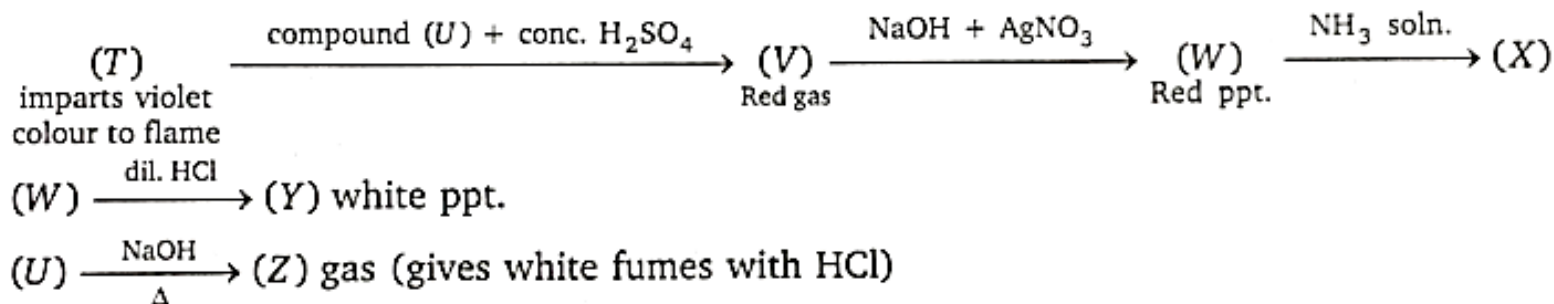
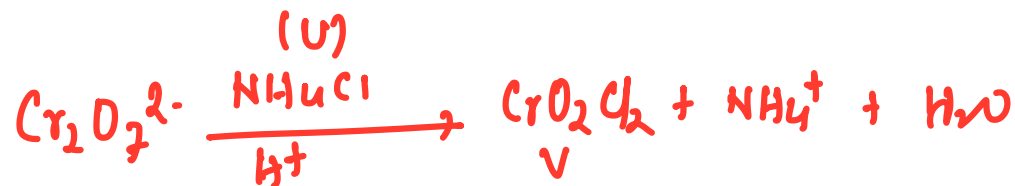




Identify (X) to (Z):

- | | | |
|--|-------------------|-----------------------------|
| (a) $X = \text{NH}_4\text{NO}_2$ | $Y = \text{NH}_3$ | $Z = \text{KNO}_2$ |
| (b) $X = (\text{NH}_4)_2\text{Cr}_2\text{O}_7$ | $Y = \text{NH}_3$ | $Z = \text{Cr}_2\text{O}_3$ |
| (c) $X = (\text{NH}_4)_2\text{SO}_4$ | $Y = \text{NH}_3$ | $Z = \text{K}_2\text{SO}_4$ |
| (d) $X = \text{NH}_4\text{NO}_3$ | $Y = \text{NH}_3$ | $Z = \text{KNO}_3$ |





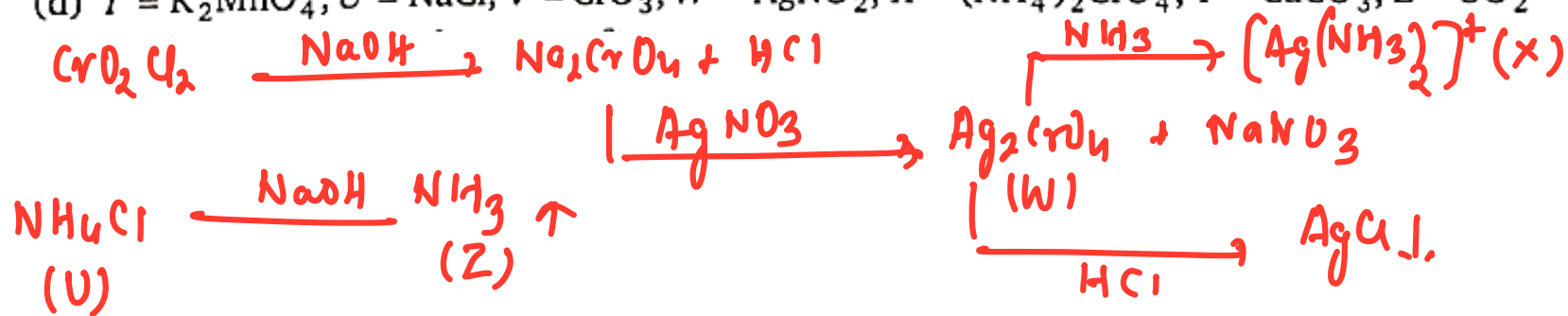
Identify (T) to (Z).

(a) T = KMnO_4 , U = HCl, V = Cl_2 , W = HgI_2 , X = $\text{Hg}(\text{NH}_2)\text{NO}_3$, Y = Hg_2Cl_2 , Z = N_2

(b) T = $\text{K}_2\text{Cr}_2\text{O}_7$, U = NH_4Cl , V = CrO_2Cl_2 , W = Ag_2CrO_4 , X = $[\text{Ag}(\text{NH}_3)_2]^+$, Y = AgCl, Z = NH_3

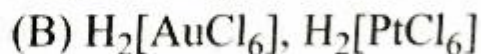
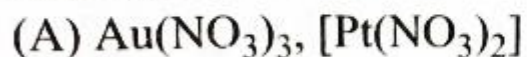
(c) T = K_2CrO_4 , U = KCl, V = CrO_2Cl_2 , W = HgI_2 , X = Na_2CrO_4 , Y = BaCO_3 , Z = NH_4Cl

(d) T = K_2MnO_4 , U = NaCl, V = CrO_3 , W = AgNO_2 , X = $(\text{NH}_4)_2\text{CrO}_4$, Y = CaCO_3 , Z = SO_2





Gold and platinum are not soluble in HNO_3 but soluble in 1 : 3 conc. mixture of HNO_3 and HCl due to the formation of respectively :



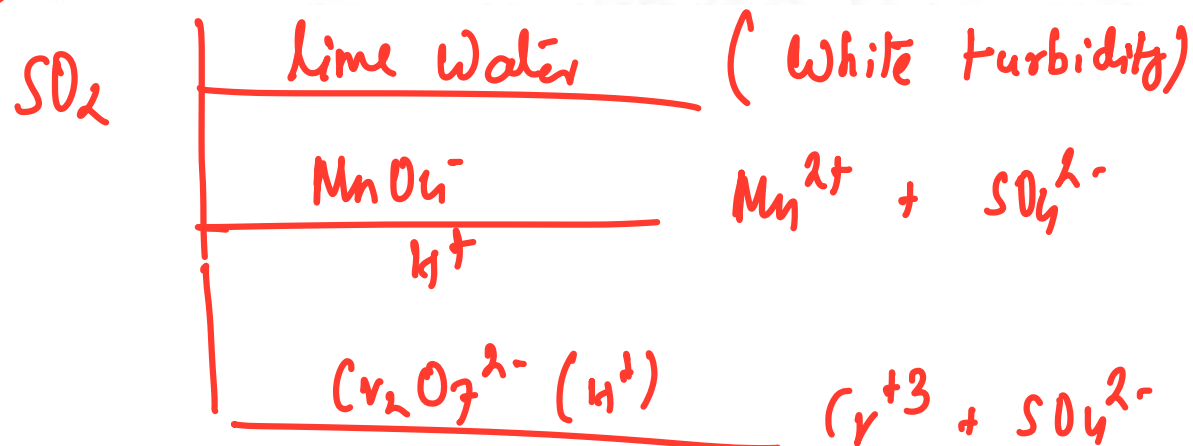
PH_3 (Phosphine) when passed in aqueous solution of CuSO_4 , produces :

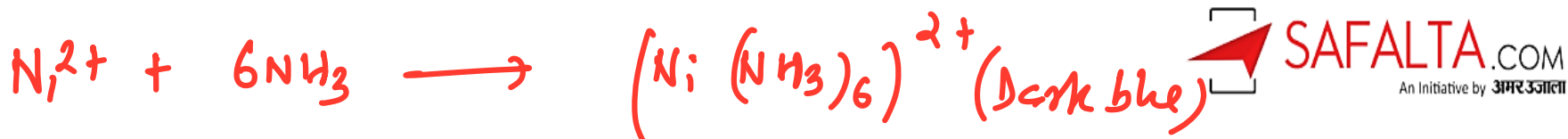
- (A) blue precipitate of $\text{Cu}(\text{OH})_2$
- (B) dark blue solution of $[\text{Cu}(\text{PH}_3)_4]\text{SO}_4$
- (C) black precipitate of Cu_3P_2
- (D) colourless solution of $[\text{Cu}(\text{H}_2\text{O})_4]^+$



Sulphur dioxide may be recognised by its :

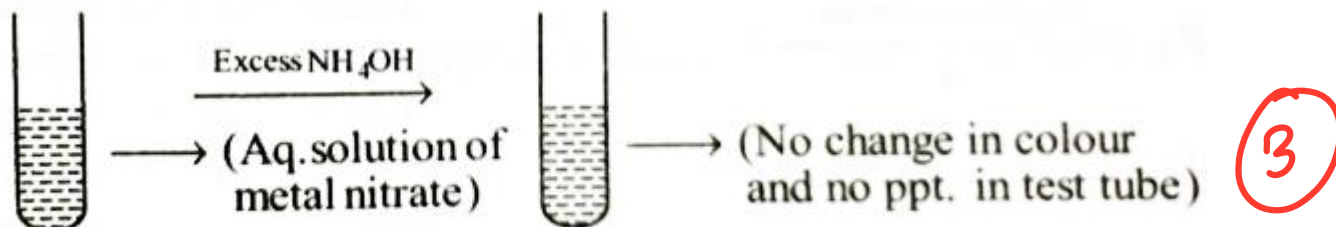
- (A) characteristic pungent smell of burning sulphur
- (B) ability to turn dichromate paper green
- (C) ability to decolourize acidified KMnO_4 solution
- (D) ☒ all of the above



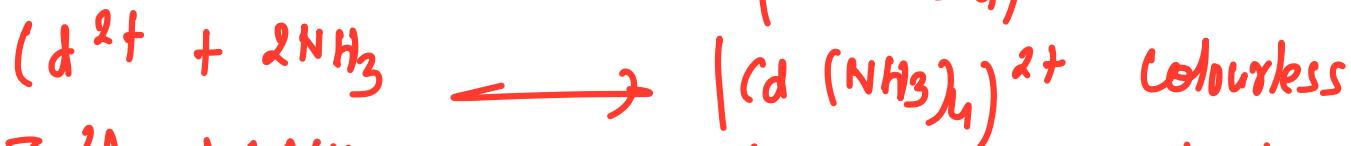


Find total no. of metal nitrate(s) which show given change :

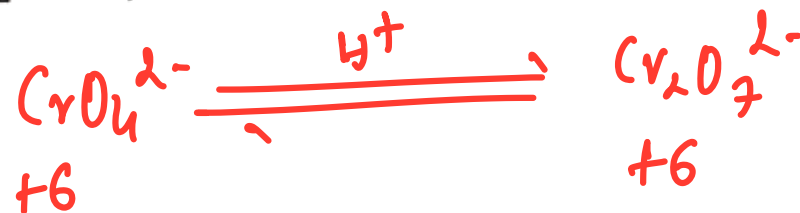
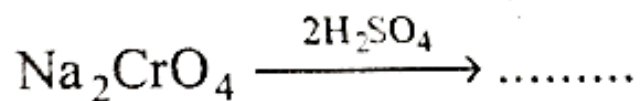
$AgNO_3$, $Pb(NO_3)_2$, $Cu(NO_3)_2$, $Cd(NO_3)_2$, $Zn(NO_3)_2$, $Ni(NO_3)_2$



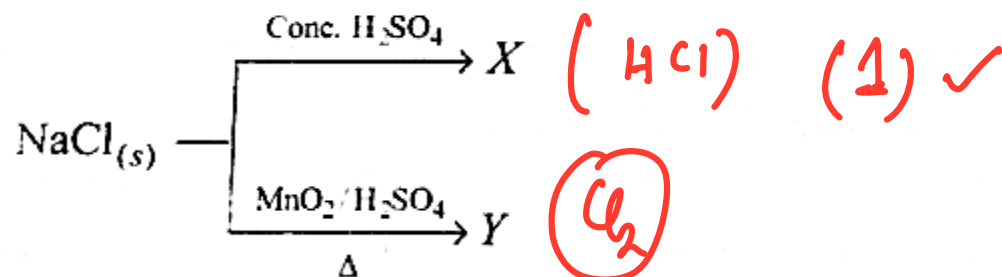
3



Find the oxidation number of chromium in product of given reaction :



Find the difference in the oxidation number of Cl in product X and product Y.



Black (dirty Pink) (Buff)
Black

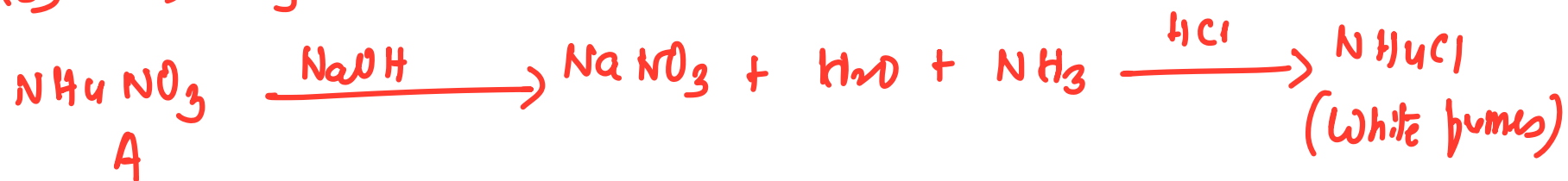
Among PbS , CuS , HgS , MnS , Ag_2S , NiS , CoS , Bi_2S_3 and SnS_2 , the total number of **BLACK** coloured sulphides is :

Ans (6-7)

(, (yellow)
brown black

PROBLEM 1 A compound on heating with an excess of caustic soda solution liberates a gas (B), which gives white fumes on exposure to HCl. Heating is continued to expel the gas completely. The resultant alkaline solution again liberates the same gas (B), when heated with zinc powder. However, the compound (A), when heated alone, does not give nitrogen. Identify (A) and (B).

(B) \longrightarrow NH_3 A \longrightarrow Ammonium Salt.



PROBLEM 5 *A compound (A) is greenish crystalline salt, which gave the following results:*

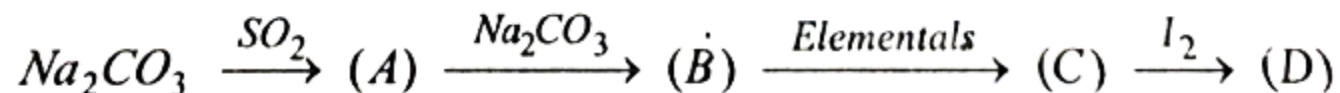
- (i) Addition of BaCl_2 solution to the solution of (A) results in the formation of a white ppt. (B), which is insoluble in dil. HCl .*
 - (ii) On heating (A), water vapours and two oxides of sulphur, (C) and (D) are liberated leaving a red brown residue (E).*
 - (iii) (E) dissolves in warm conc. HCl to give a yellow solution (F).*
 - (iv) With H_2S , the solution (F) yields a pale yellow ppt. (G), which when filtered, leaves a greenish filtrate (H).*
 - (v) Solution (F) on treatment with thiocyanate ions gives blood red coloured compound (I).*
- Identify the substances from (A) to (I).*

PROBLEM 7 A gaseous mixture containing (X), (Y) and (Z) gases, when passed into acidified $K_2Cr_2O_7$ solution, gas (X) was absorbed and the solution was turned green. The remainder gas mixture was then passed through lime water, which turns milky by absorbing gas (Y). The residual gas when passed through alkaline pyrogallol solution, it turned black. Identify gas (X), (Y) and (Z) and explain the reaction involved.

PROBLEM 13 *An orange solid (A) on heating gives a green residue (B), a colourless gas (C) and water vapour. The dry gas (C) on passing over heated Mg gave a white solid (D). (D) on reaction with water gave a gas (E) which formed dense white fumes with HCl. Identify (A) to (E) giving reactions.* (IIT 1993)

PROBLEM 20 *Element (A) burns in nitrogen to give ionic compound (B). Compound (B) reacts with water to give (C) and (D). A solution of (C) becomes milky on bubbling CO_2 . Identify (A), (B), (C) and (D).*
(IIT July 1997)

PROBLEM 37 Identify the following:



Also mention the oxidation state of S in all the compounds. (IIT 2003)

1. 0.16 g of an organic compound, on complete combustion, produced 0.44 g of CO_2 and 0.18 g of H_2O . Calculate the percentage of carbon and hydrogen in the organic compound.