

D-BLOCK - L-2

Formation of interstitial compound

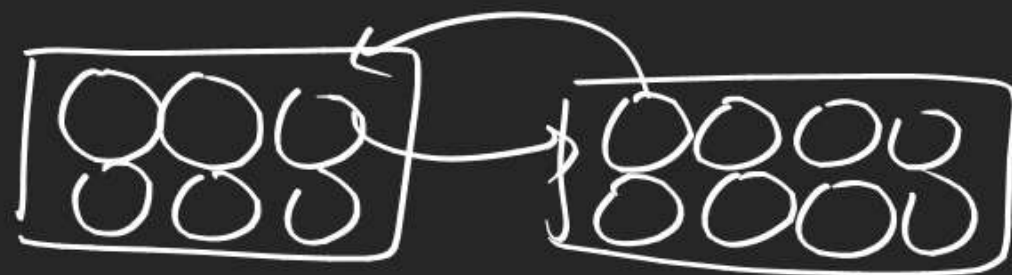


- They retain Metallic conductivity
- They Chemically inert



- ① They have high m.p, than the Pure metal
- ② They Harder than Pure metal
Some borides are approaching diamond to hardness
- ③ Density higher than pure metal

alloy formation



d-block element have higher tendency
to form alloy due to their similar size

Hg can form alloy with many metals
except Fe Pt W

Note \Rightarrow for alloy formation 15% diff of size
between element

* German silver = Ag not
present

Brass = (Cu + Zn)

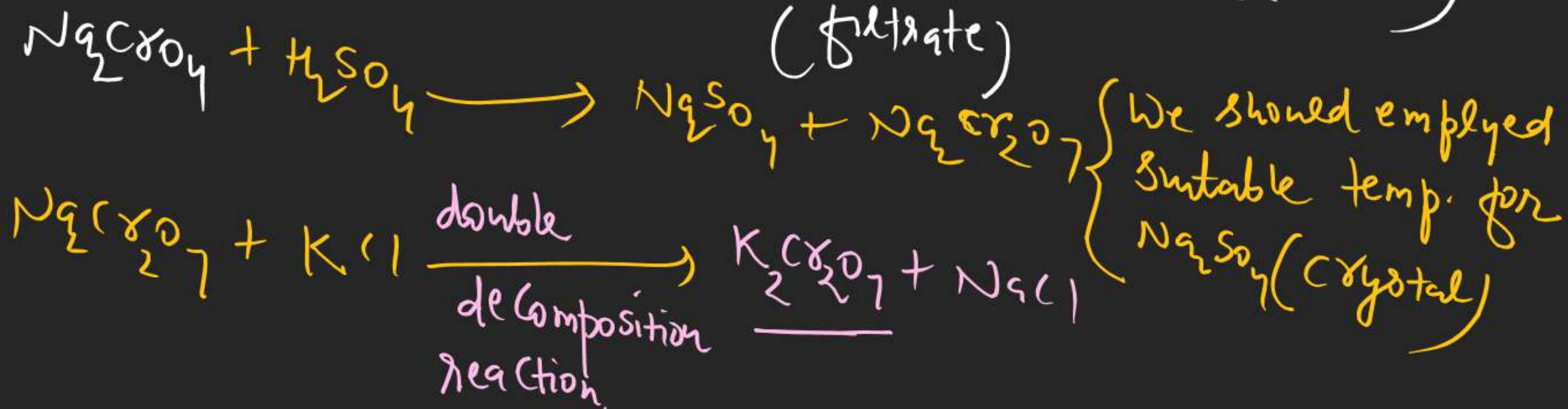
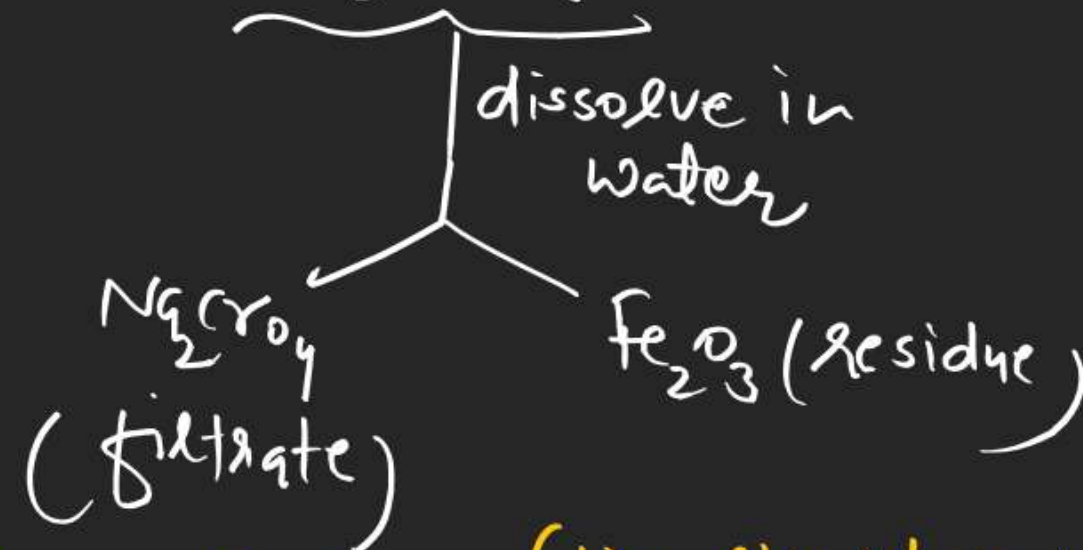
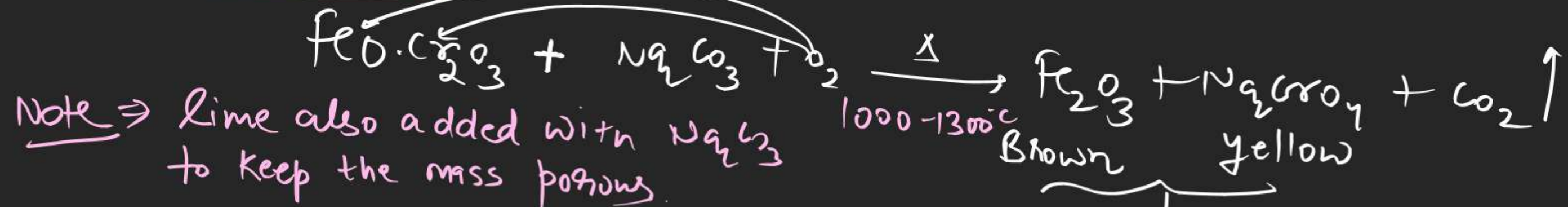
Bronze = (Cu + Sn)

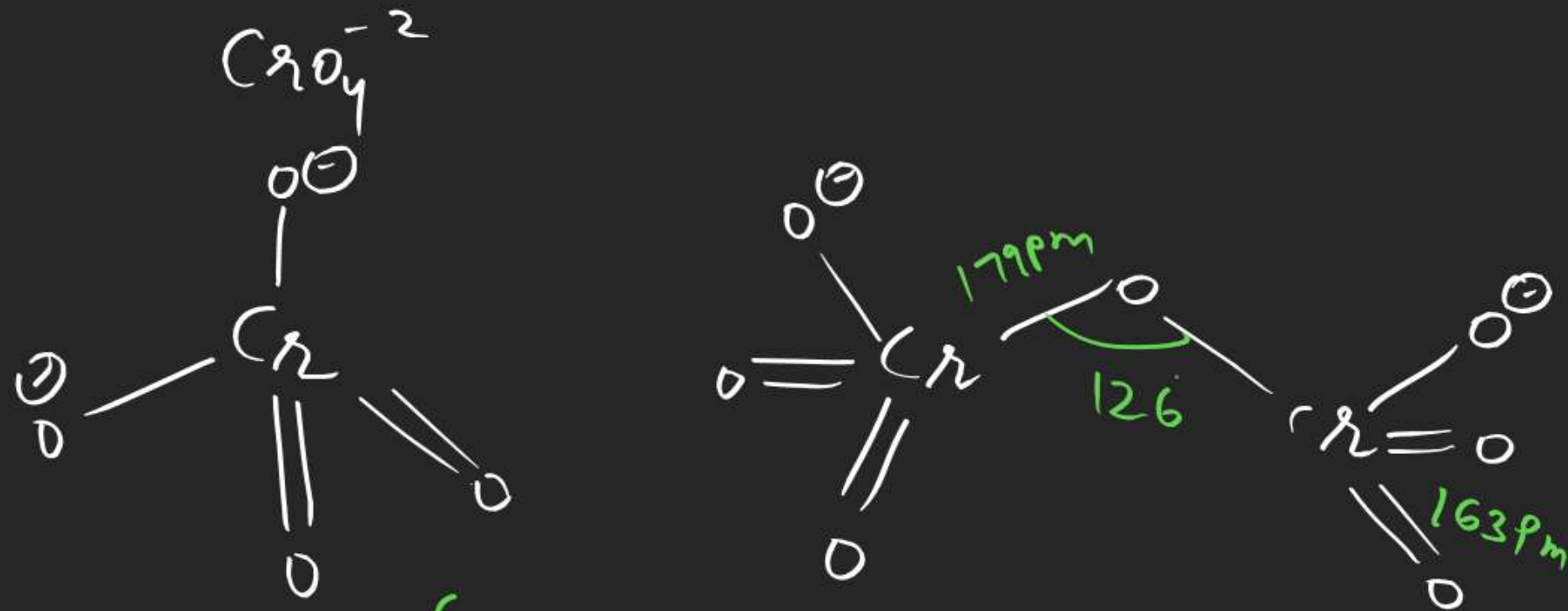
alloy Homogeneous
Mixture

Note \Rightarrow alloy are Hard and Have higher M.P

Prep. of $K_2Cr_2O_7$

(Chromite ore)

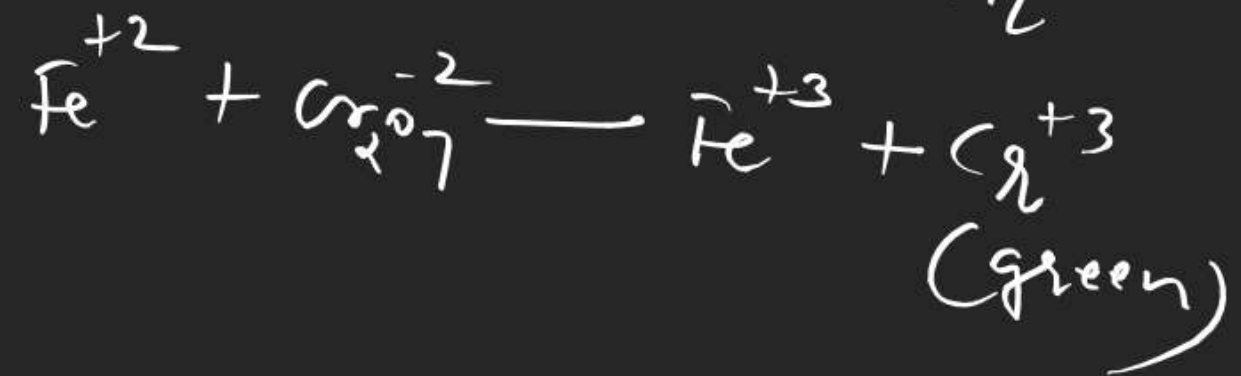
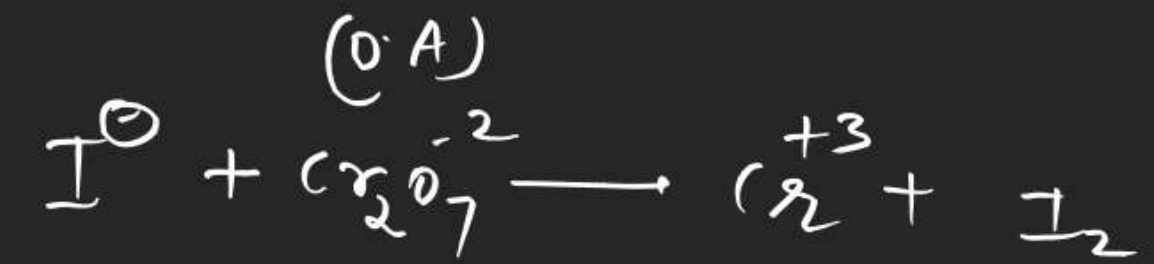




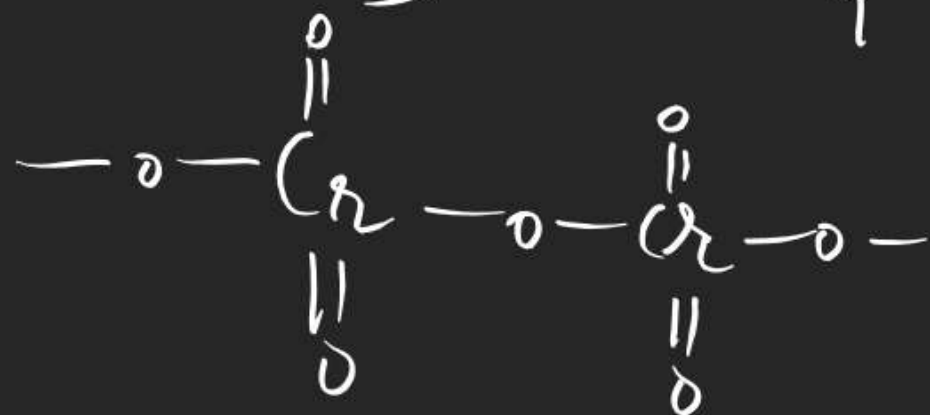
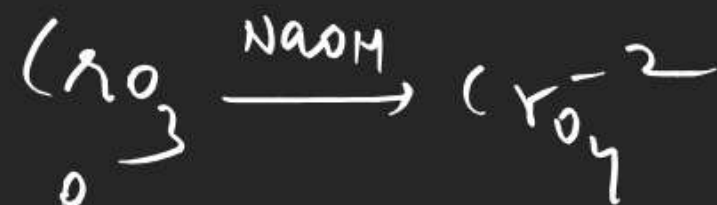
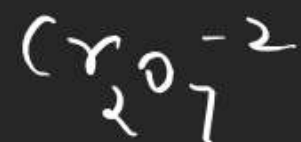
find the identical C-O bond = ?

Ans = 6

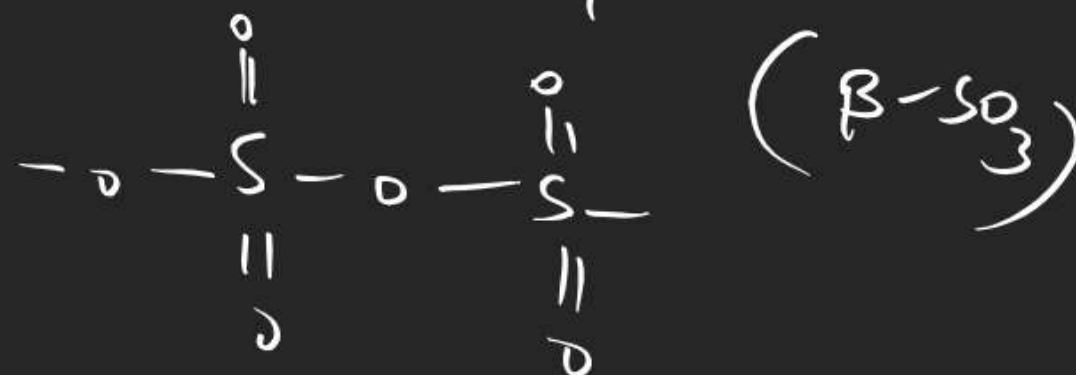
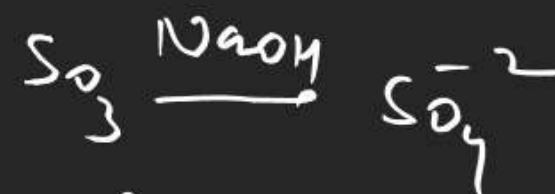
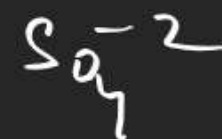
$\text{Cr}_2\text{O}_7^{-2}$ is good oxidising

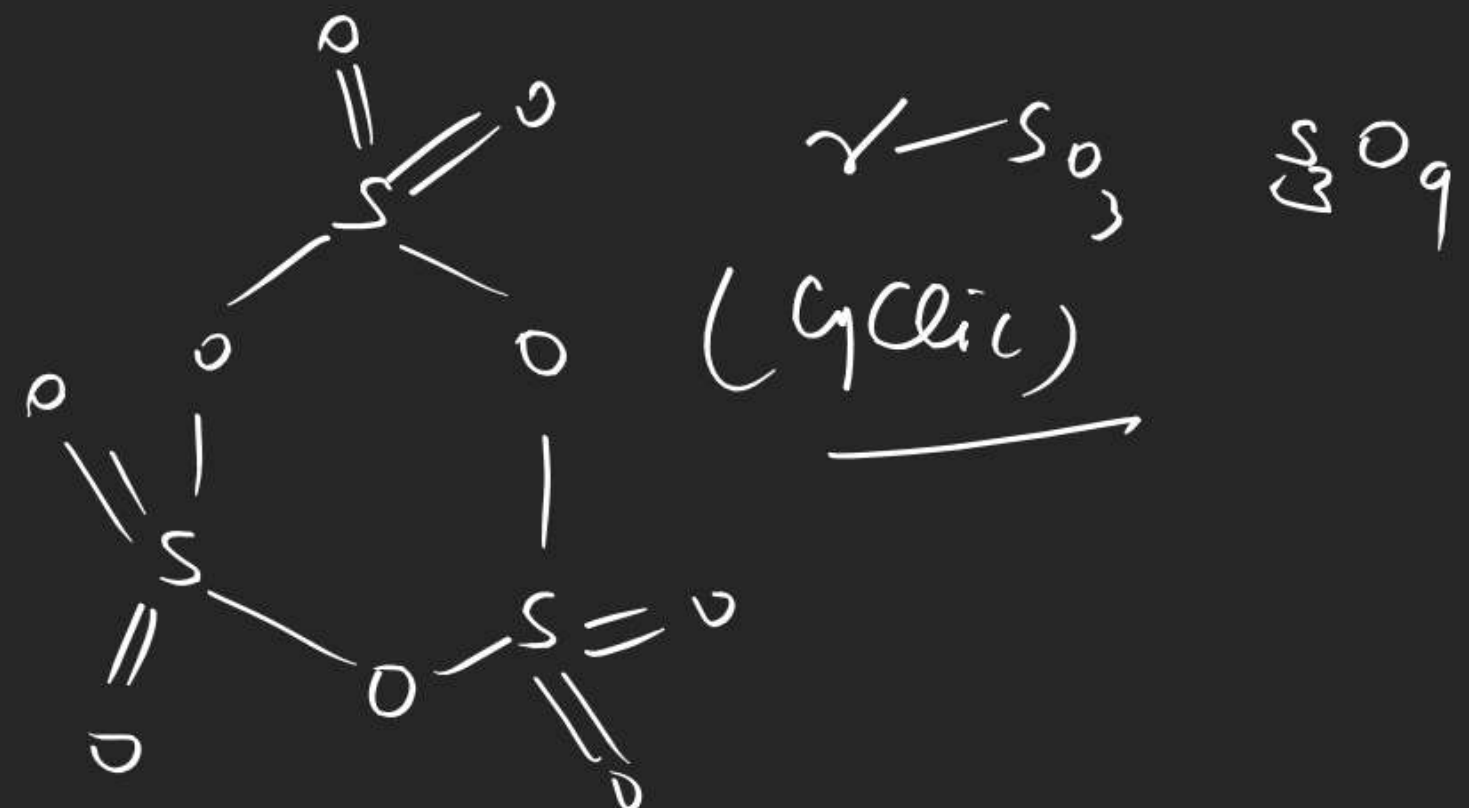
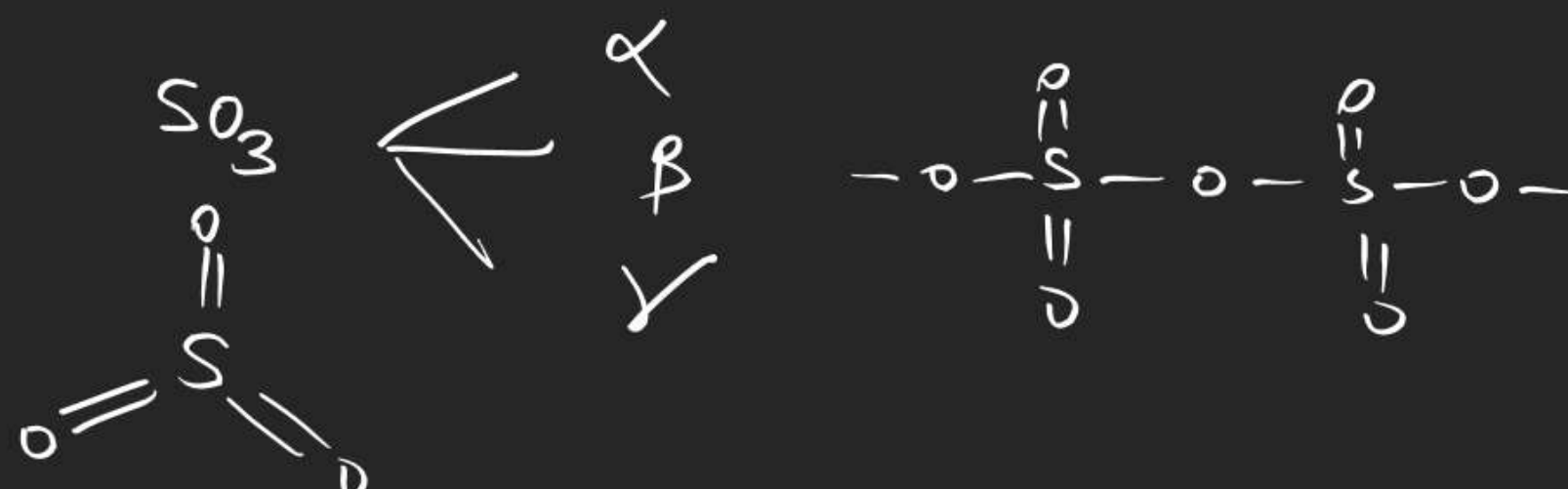


VI B



VI A





Ques

$K_2Cr_2O_7$ is used as primary standard
not $Na_2Cr_2O_7$ Why?

Ans \Rightarrow

Prep of K_2MnO_4



MnO_4^{2-}
(green melt)



Note \Rightarrow [we can use $KClO_3$ or KNO_3 for fast reaction in place of air]

Cold water
+
little alkali

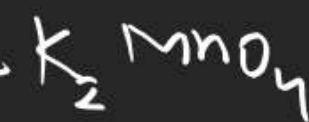
MnO_4^{2-}
(green solution)

evaporate

with
NaOH



with
KOH

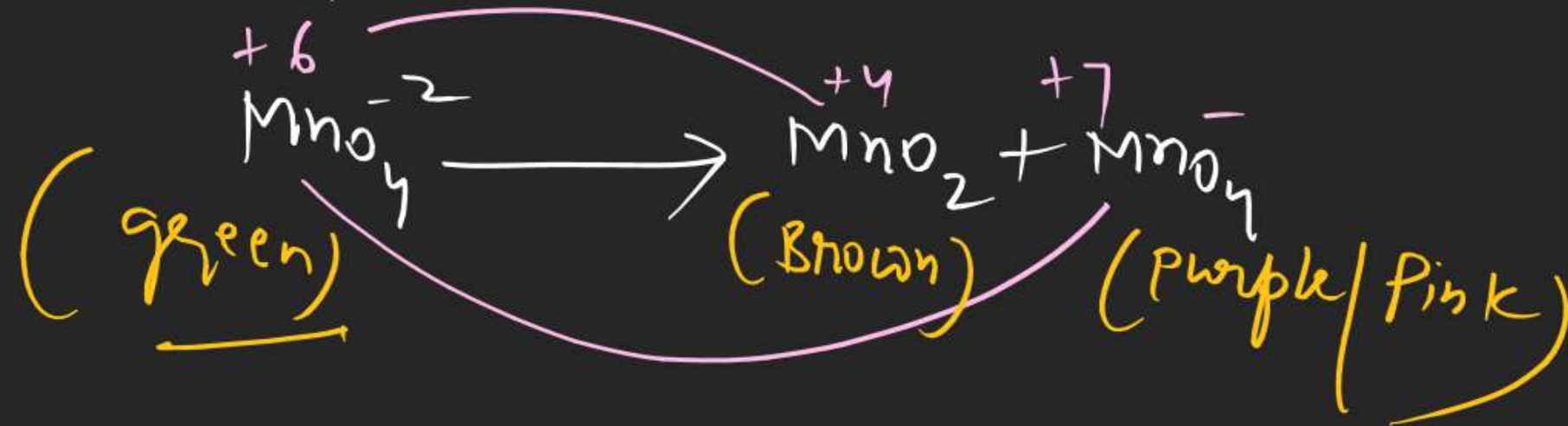


$Na_2MnO_4 \cdot 10H_2O$ isomorphous with $Na_2SO_4 \cdot 10H_2O$
 K_2MnO_4 isomorphous with K_2SO_4

$\text{MnO}_4^{2-} \Rightarrow$ exist in only strong alkaline solution.

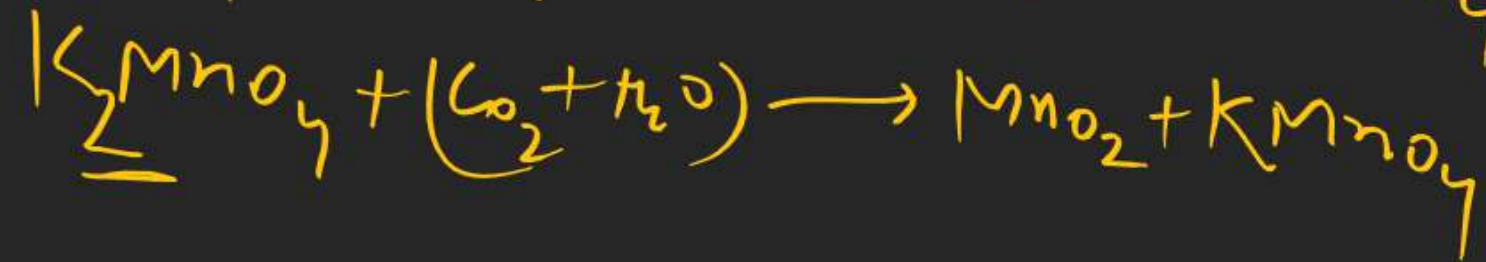
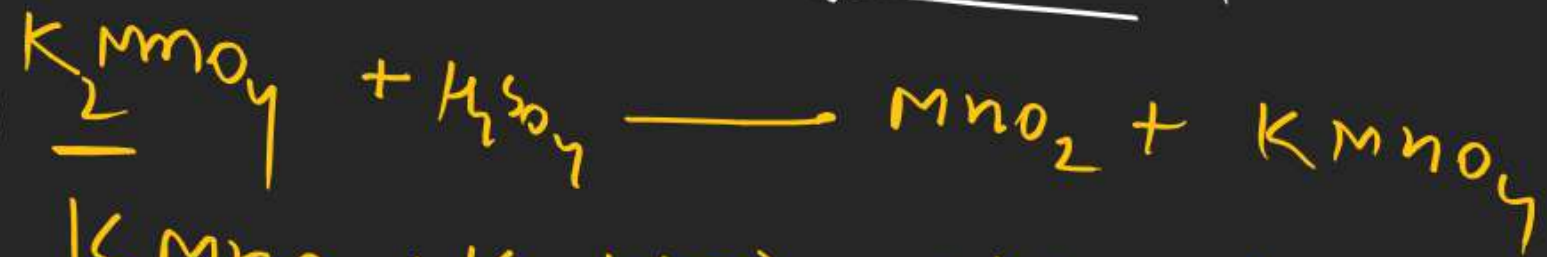
In acidic medium / neutral / aq. medium / light basic

MnO_4^{2-} will disprop.

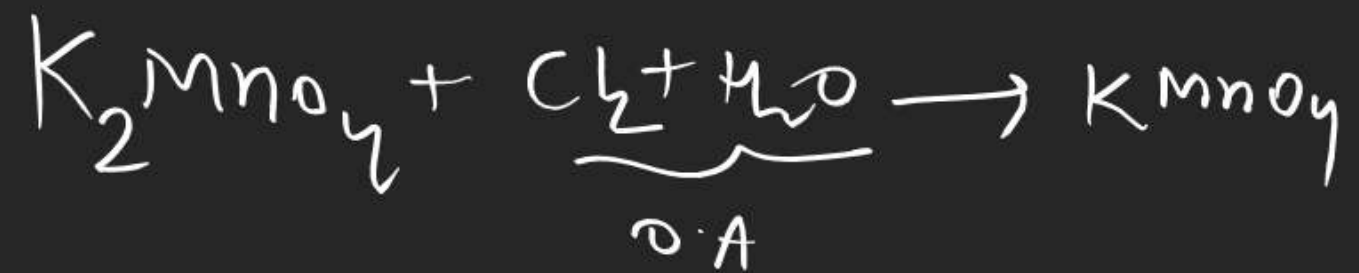


Lab.

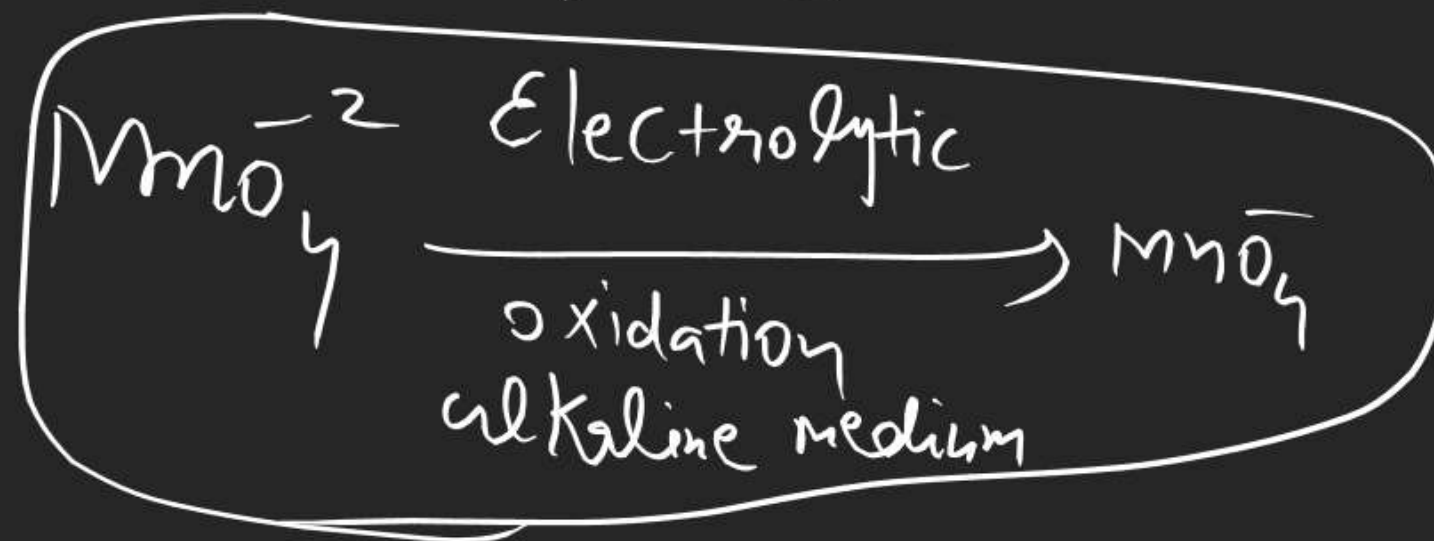
formation of $KMnO_4$ through K_2MnO_4



$\frac{1}{3} Mn$ lose due to formation of MnO_2

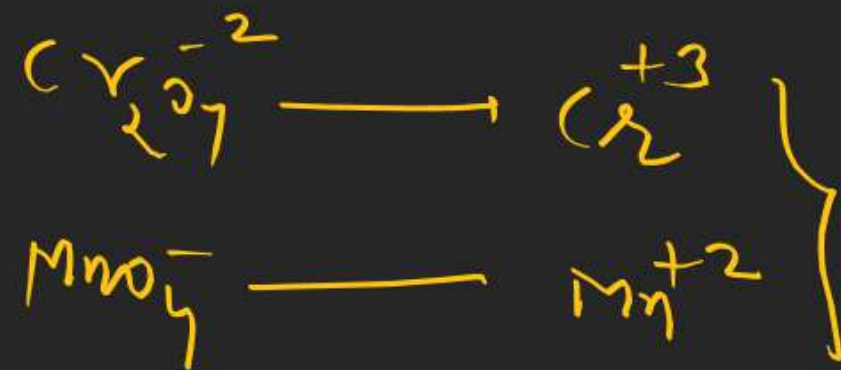


★



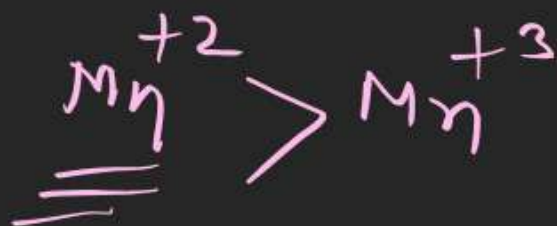


ex



$$\begin{aligned} \text{Cr}^{+3} / \text{Cr}^{+2} &= -0.41 \\ \text{Mn}^{+3} / \text{Mn}^{+2} &= +1.51 \end{aligned}$$

Stability of Ion



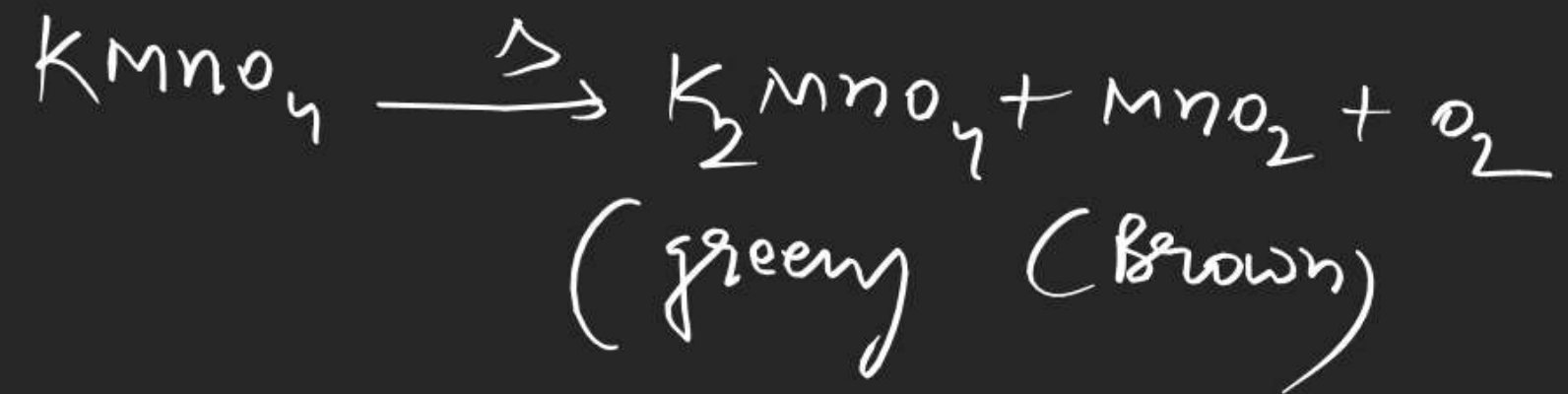
$$\Delta G = -nFE^0$$

$$\checkmark \text{Co}^{+3} / \text{Co}^{+2} \Rightarrow +1.98$$

KMnO_4 is not used as primary standard
because it is difficult to get it in high
purity, it traces of MnO_2

it will decompose by light and acid
So it is kept in dark brown
bottles

Heating effect



Photography

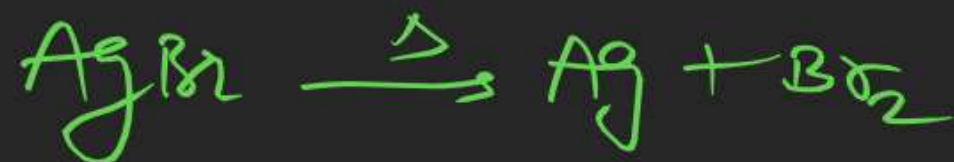
it is based on photo sensitivity of silver halides
mainly AgBr

① Prep of film:-

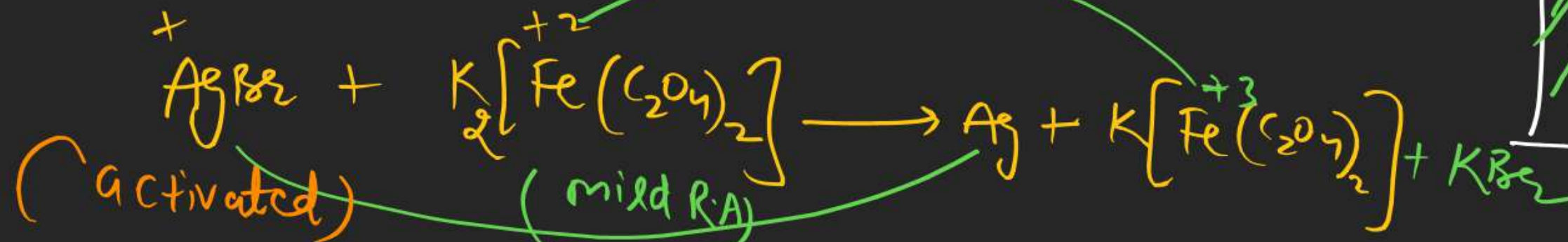


Paste is coated on cellulose strip and dried in dark.

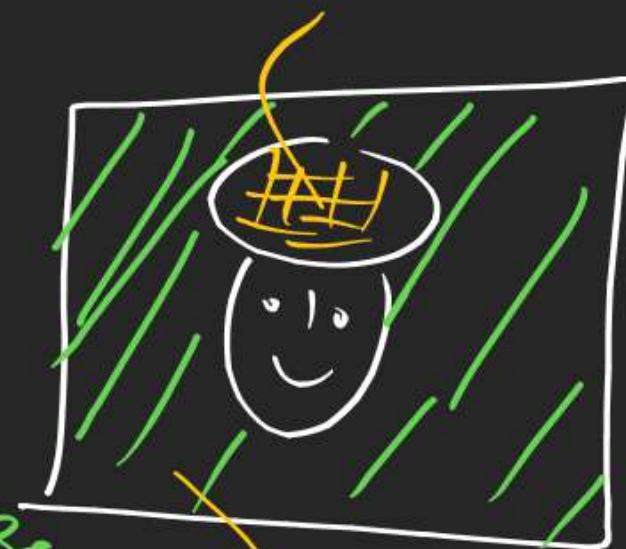
(2) exposure to light



(3) develop



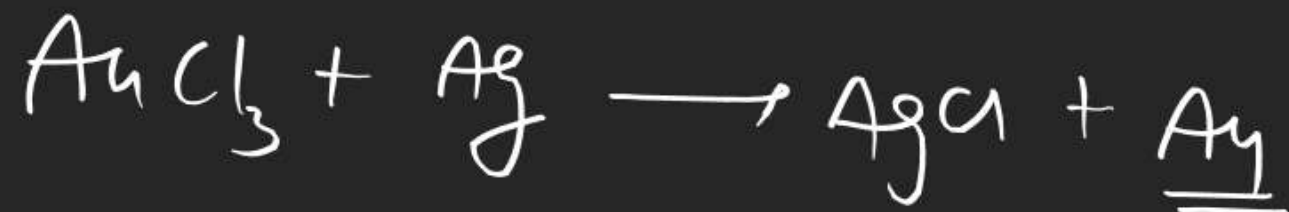
activated AgBr



unreacted AgBr

Print on paper

Toning



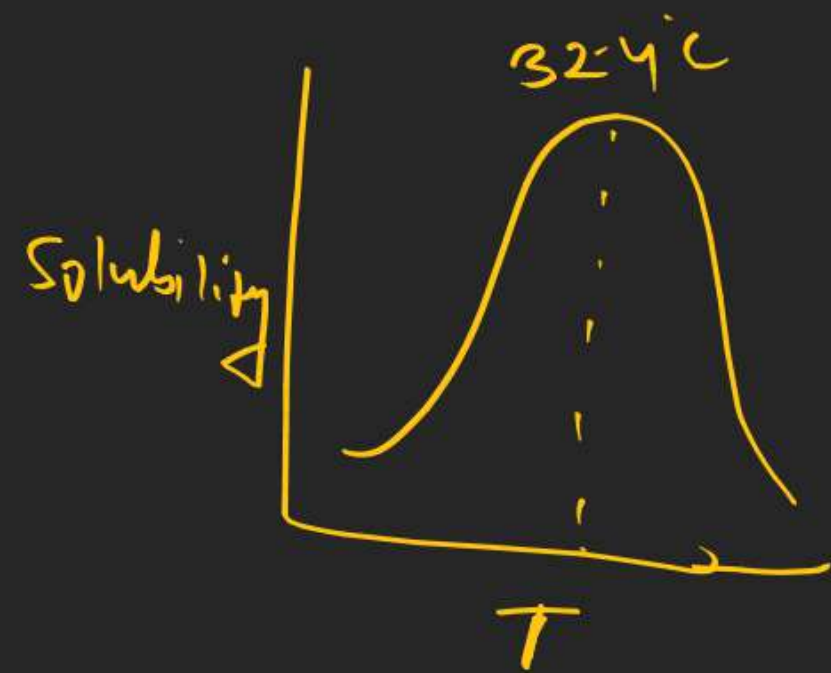
Note \Rightarrow golden and grey tint impart on photograph by using AuCl_3 and $\text{K}_2[\text{PtCl}_6]$ respectively

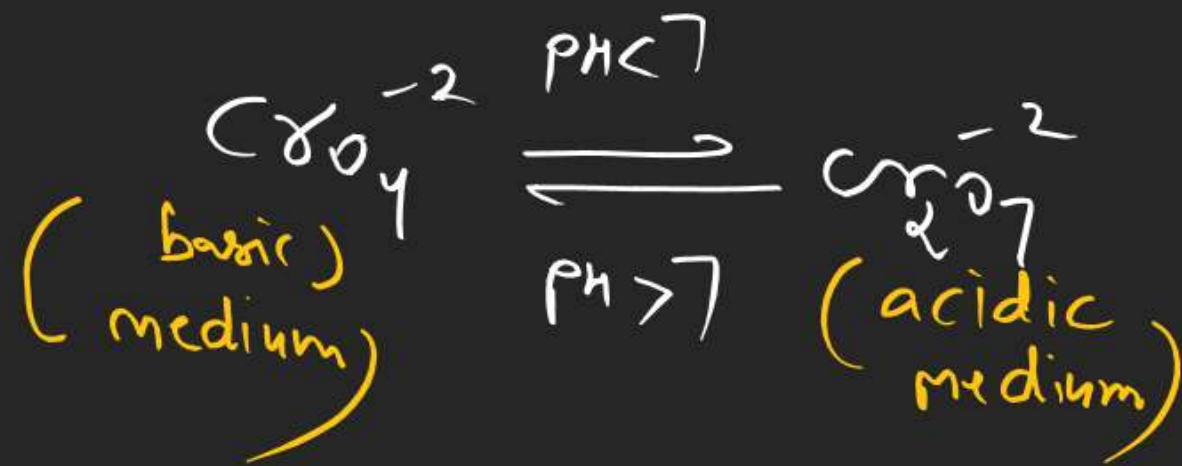
Note \rightarrow unreacted AgBr

Can be removed by treating it with
hypo solution ($\text{Na}_2\text{S}_2\text{O}_3$)



Isomorphous \Rightarrow Same crystalline structure
but diff. physical and
chemical prop.





Note \Rightarrow Chromate and dichromate exist in eq- condition in aq- solution depending on the pH of the solution