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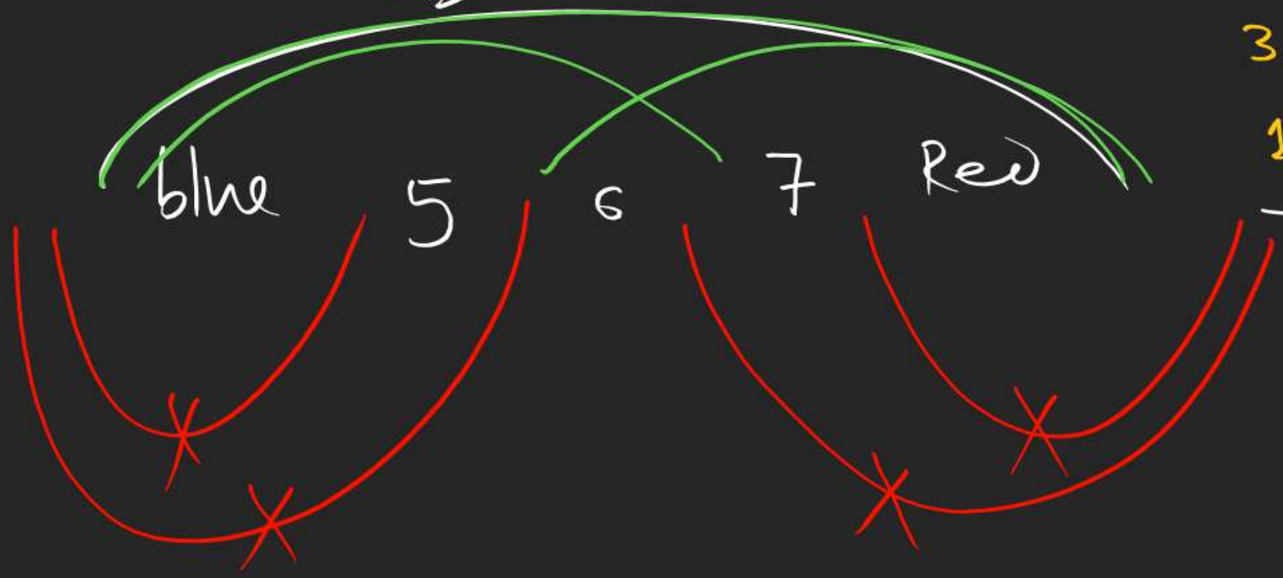
SA → 3

SB → 11

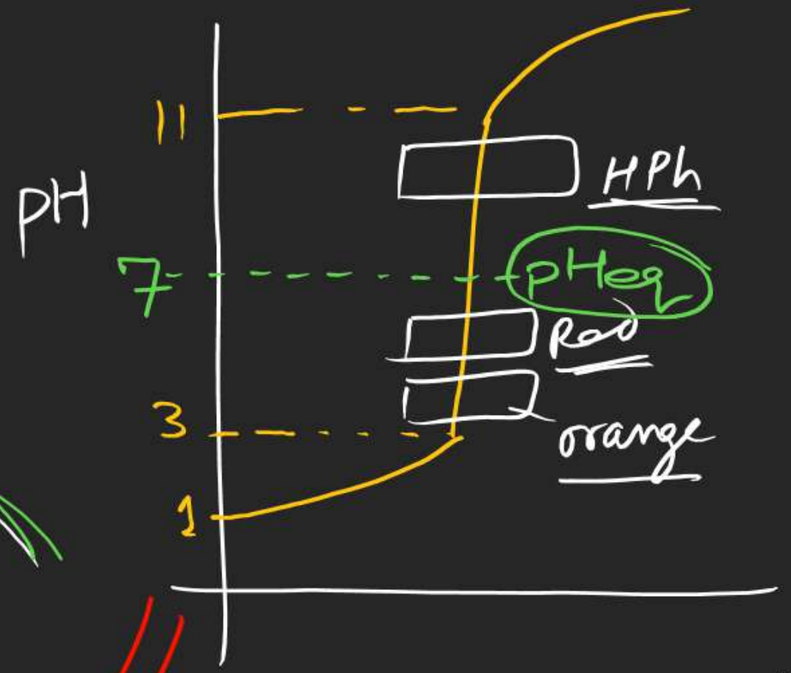
WA → 5·5

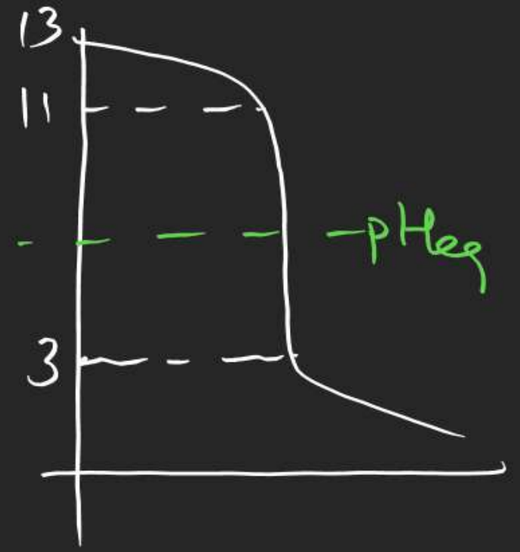
WB → 8·5



① Titration of SA + SB

e.g HCl + NaOH

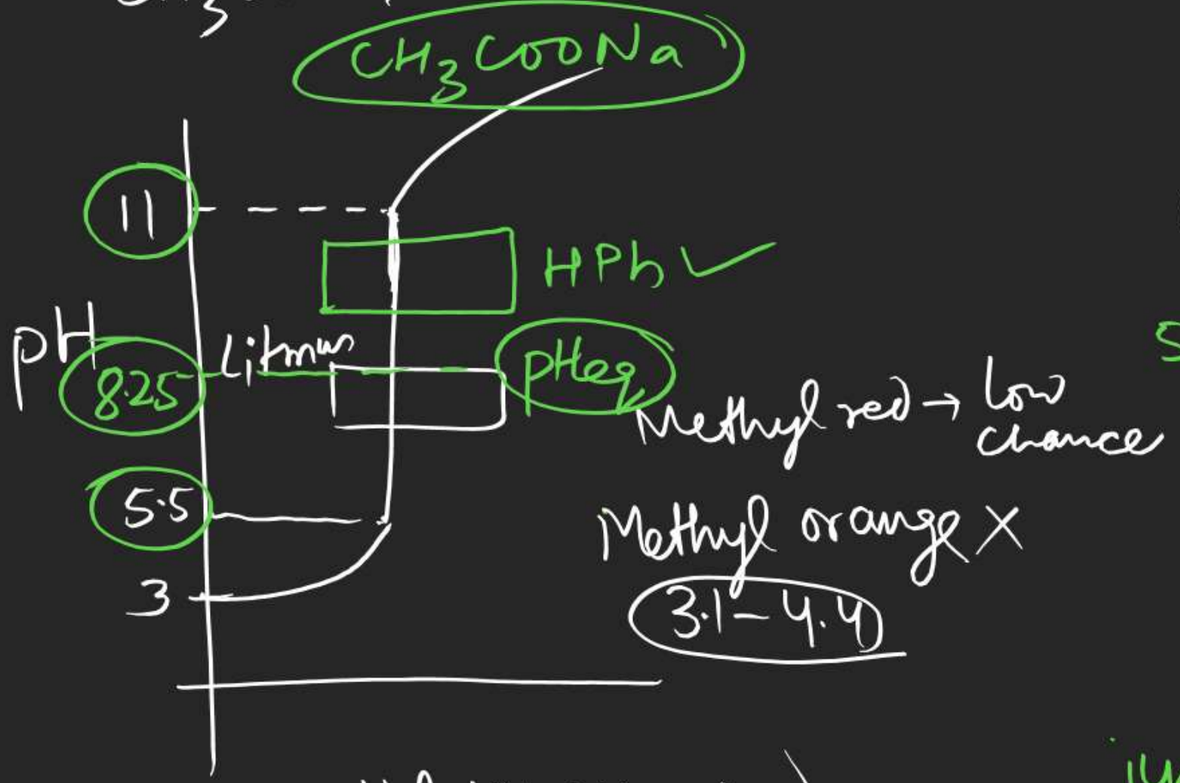




vol. of NaOH added

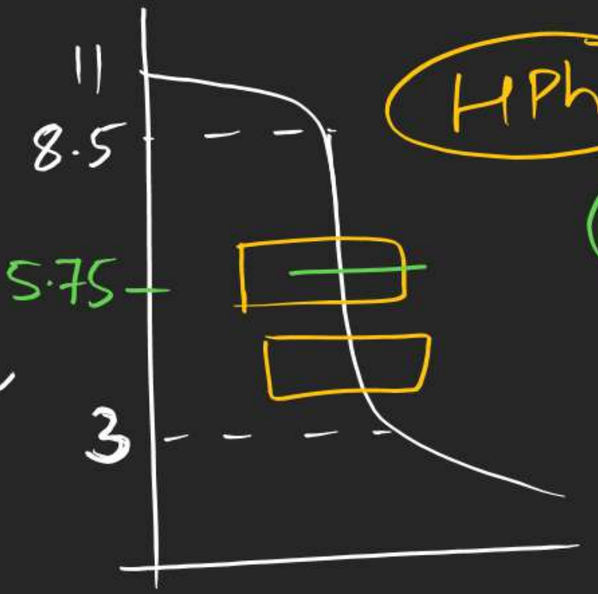
(II) Titration of WA + SB

$CH_3COOH + NaOH$



(III) Titration of WB + SA

$NH_4OH + HCl$



Cond^n for the most suitable indicator

jump → $pH_{eq} \pm 2$

range — $pK_{In} \pm 1$

$pK_{In} = pH_{eq}$

Double indicator acid base titration :→

e.g Na_2CO_3 with HCl

$Na_2CO_3 + HCl \longrightarrow NaHCO_3 + NaCl$ (10 – 8)

1 mol

$NaHCO_3 + HCl \longrightarrow H_2CO_3 + NaCl$ (6·5 – 3)

Given: $n_{Na_2CO_3} = x$ - no. of moles of HCl required to change the colour of

(i) phenolpthalein $n_{HCl} = x$

(ii) Methyl orange $n_{HCl} = 2x$

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Q. $n_{Na_2CO_3} = x$

HPh $\quad n_{HCl} = 3 = x$

Methyl orang $\quad n_{HCl} = 4\,mol = 2x$

$x = 2$

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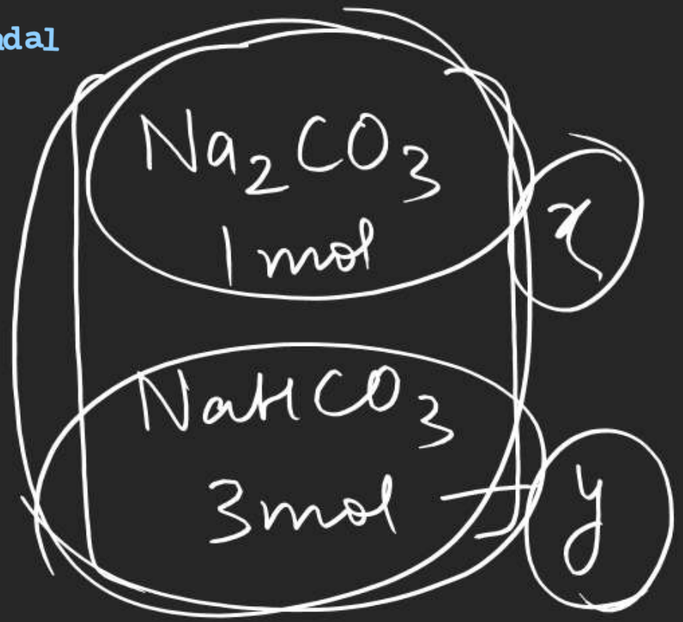
Q.



HPh $\quad n_{HCl} = x$

$$Na_2CO_3 + HCl \rightarrow \underset{1\ mol}{NaHCO_3} + NaCl$$

Na_2CO_3 : 1 mol

Methyl orange

$$n_{HCl} = 2x + y$$

2
4
5
8