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$K_{soln} = 8.75 \times 10^{-7}\ S\,cm^{-1}$

$K_{H_2O} = 0.75 \times 10^{-7}\ S\,cm^{-1}$

$$\Lambda_m = \frac{K_{AgBr} \times 1000}{S}$$

$K_{AgBr} = (8.75 - 0.75) \times 10^{-7}$

AgBr - Soln

$G_{soln} = \frac{1}{R}$

0.1M NH4Cl

$G = \frac{1}{R}$

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65 $\Lambda_m^{\infty}(H_2O) = 5.5 \times 10^{-2}\ S\,m^2\,mol^{-1}$

$$\Lambda_m^{\infty}(H_2O) = \frac{K}{1000 \times S}$$

$$K_w = S^2$$

$0.1\,M\ CH_3COOH$ pH

$$\Lambda_m = \frac{K \times 1000}{0.1}$$

$$\frac{\Lambda_m}{\Lambda_m^{\infty}} = \alpha \qquad [H^+] = C\alpha$$

$$\Lambda_m = \frac{K}{1000 \times C}$$

$$C = \frac{1000}{18}$$

$$\frac{\Lambda_m}{\Lambda_m^{\infty}} = \alpha$$

$$[H^+] = C\alpha$$

$$K_w = (C\alpha)^2$$

$$\Lambda_m^{\infty} = \frac{K}{1000 \times (C\alpha)}$$

$$\Lambda_m^{\infty} = \frac{K \times 1000}{S = [H^+]}$$

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Conductometric titrations :→

In a titration process some of the ions are replaced by some other ions. These ions have different Λ_m, hence conductance of solution varies

$[H^+]$	$[Cl^-]$	$[Na^+]$	$[OH^-]$
1	1	0	0
1	1	0.1	0.1
0.9	1	0.1	0

$\Rightarrow$ These changes are <u>very large</u> if H^+ or OH^- are replaced by some other ions or they replace the other ions.

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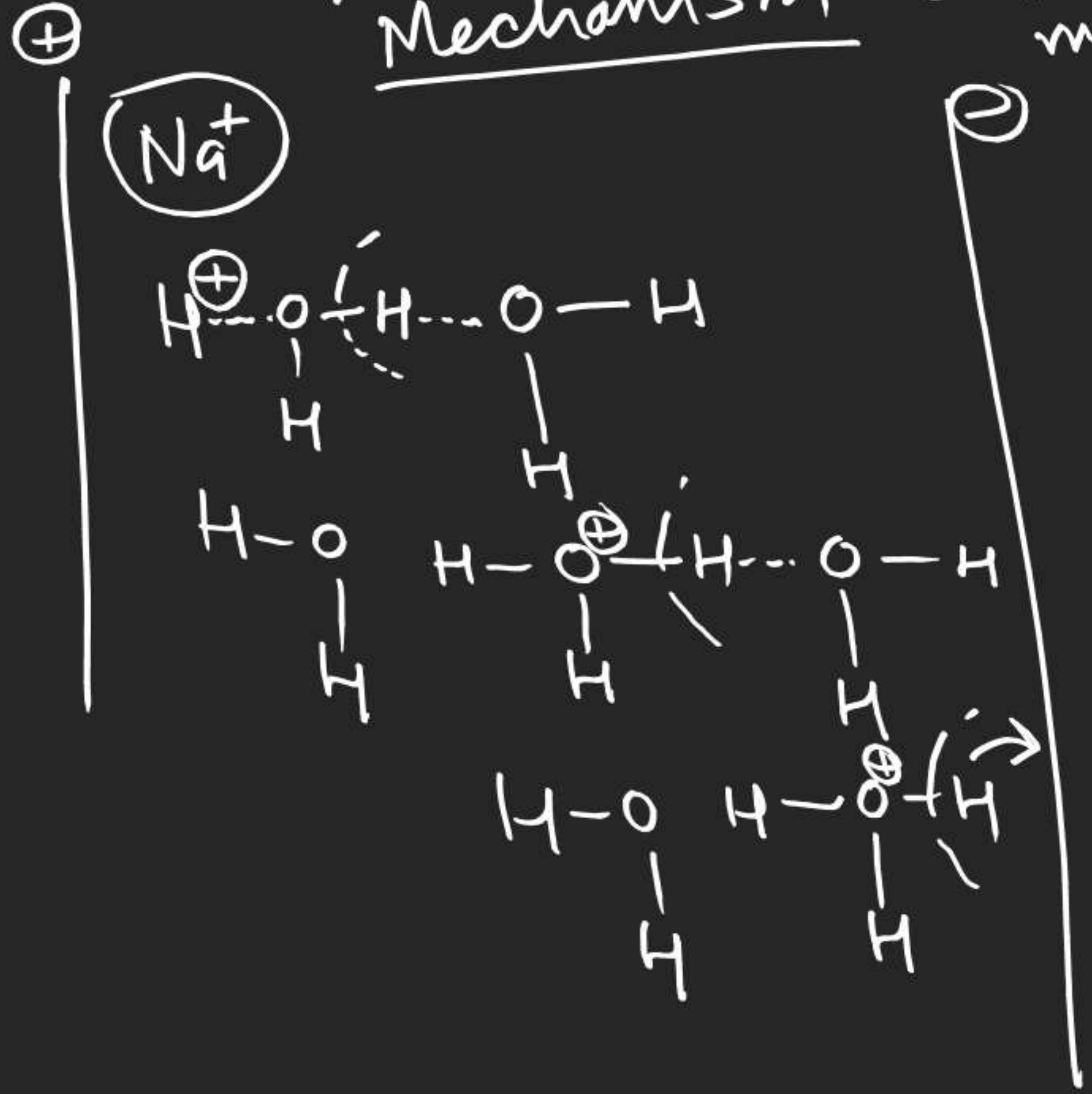
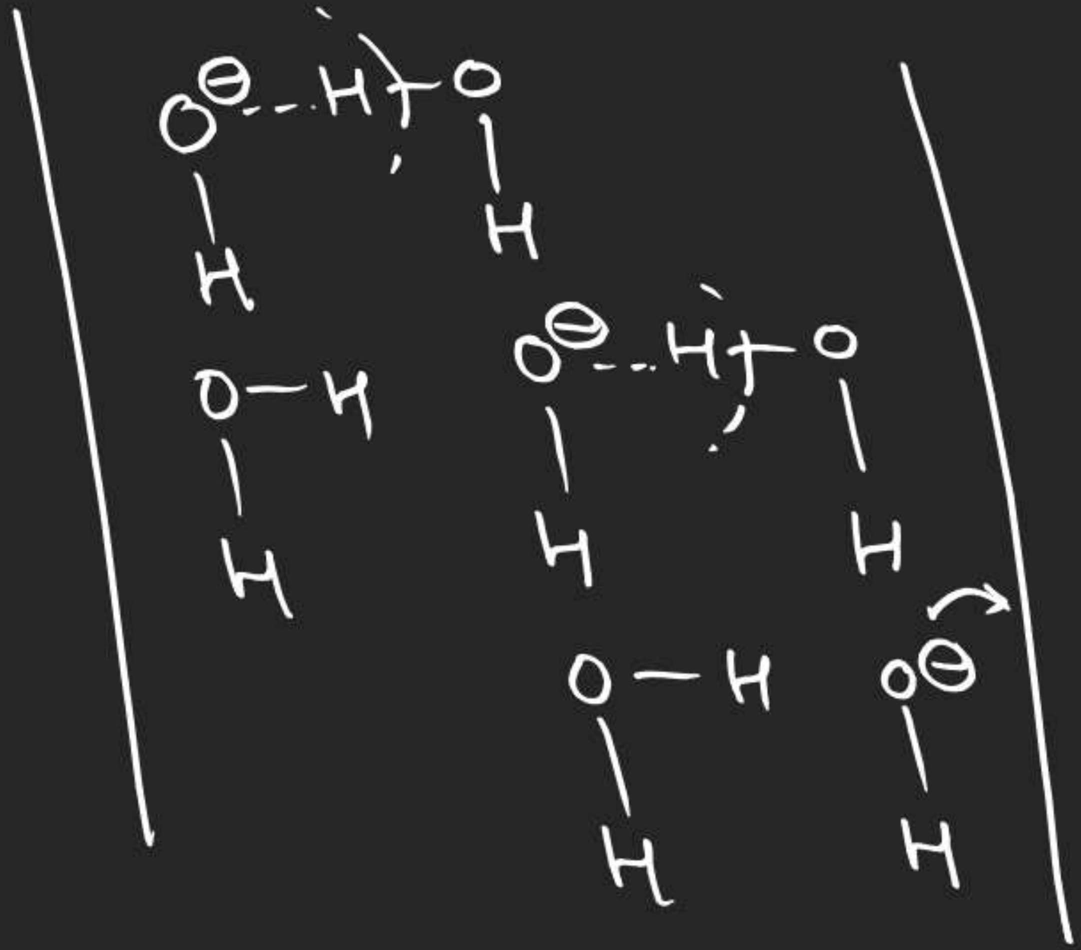
$$K^+ > Na^+ \ll H^+$$

Grothus Mechanism (Charge jump mechanism)





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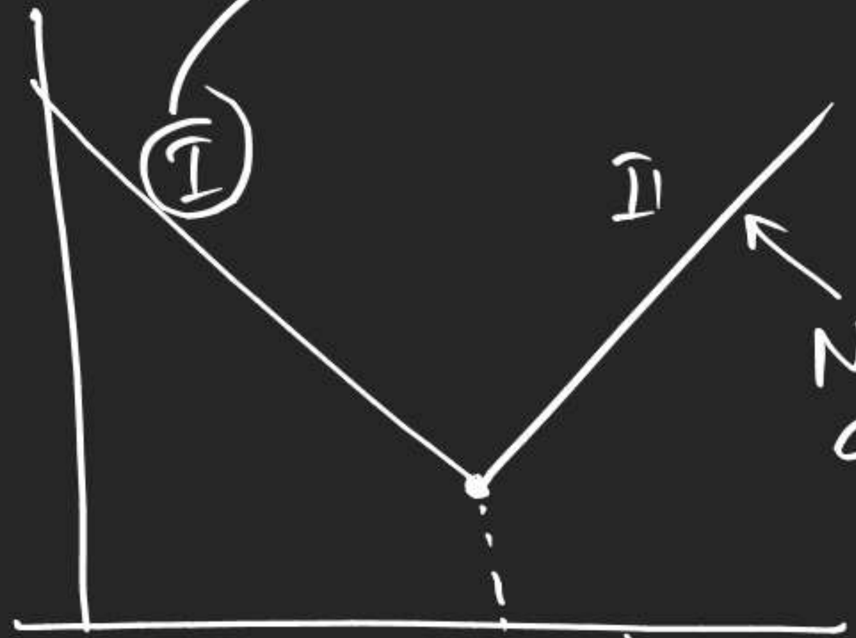
① Titration of SA + SB

HCl (aq) + NaOH(aq)

H^+ are replaced by Na^+

G

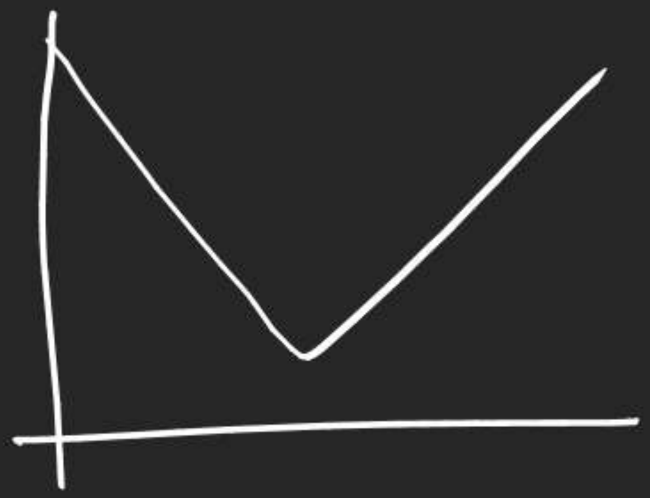


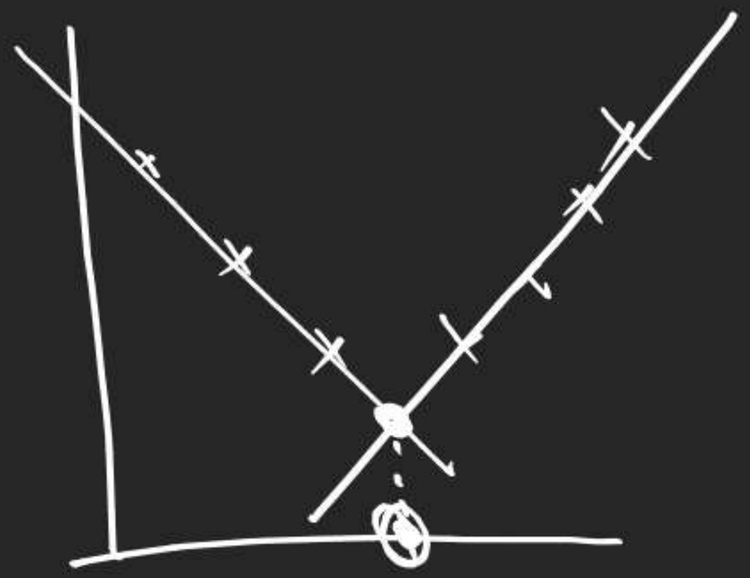
Na^+ & OH^- conc ↑es

eq pt

Vol. of NaOH added

NaOH (aq) + HCl (aq)





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(II) WA + SB

$CH_3COOH(aq) + NaOH(aq)$

10 mmol   1 mmol

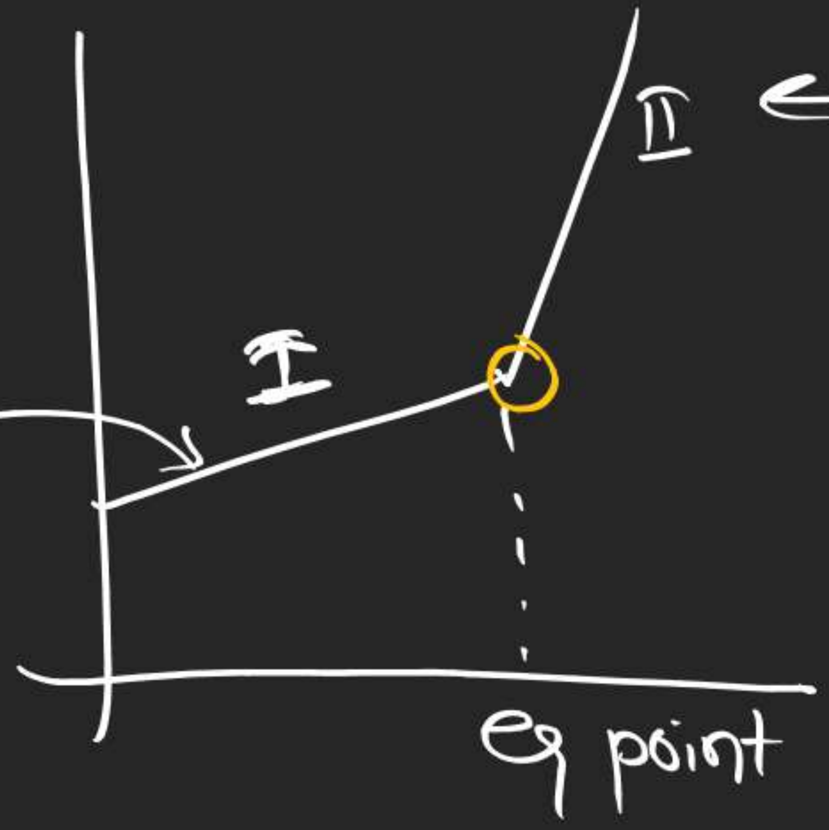
9.1 mmol → 9 mmol

H^+

0.1 mmol

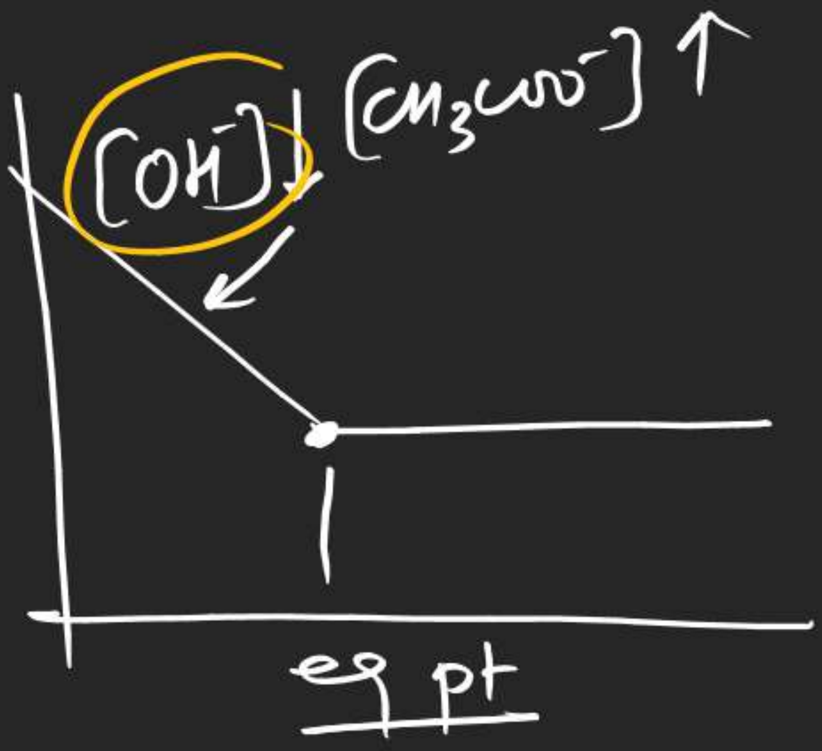
CH_3COONa → CH_3COO^- Na^+

Unionised CH_3COOH is replaced by CH_3COONa



II ← Na^+ & OH^- conc ↑

(III) $NaOH + CH_3COOH$

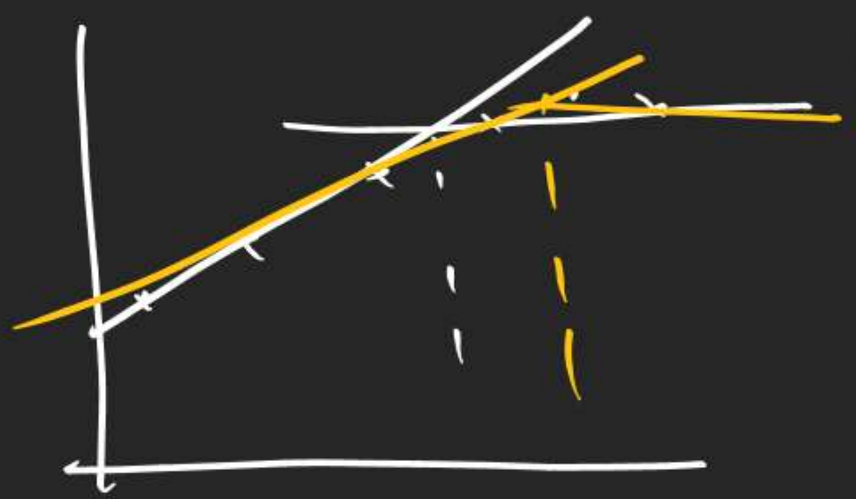


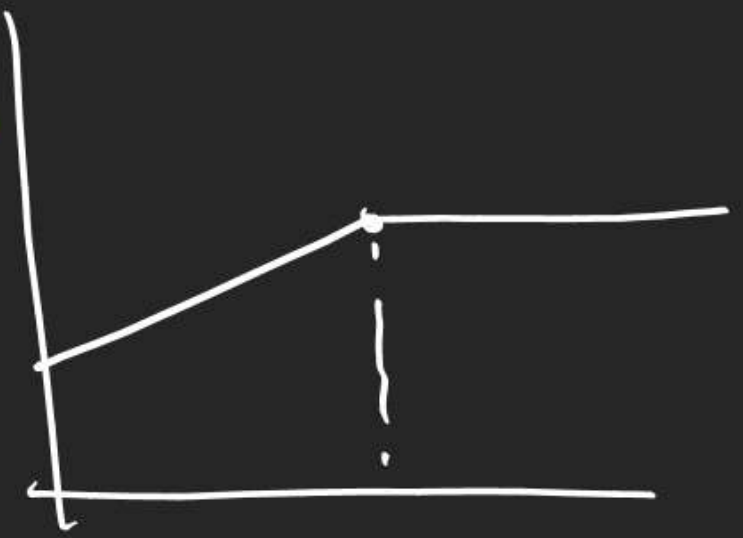
Na^+	OH^- ↓	CH_3COO^-	H^+
1	1	0.1	0.1
1	0.9	0.1	0

$CH_3COONa \leftarrow CH_3COOH$

(IV) WA + WB

$CH_3COOH + NH_4OH \longrightarrow CH_3COONH_4 + H_2O$





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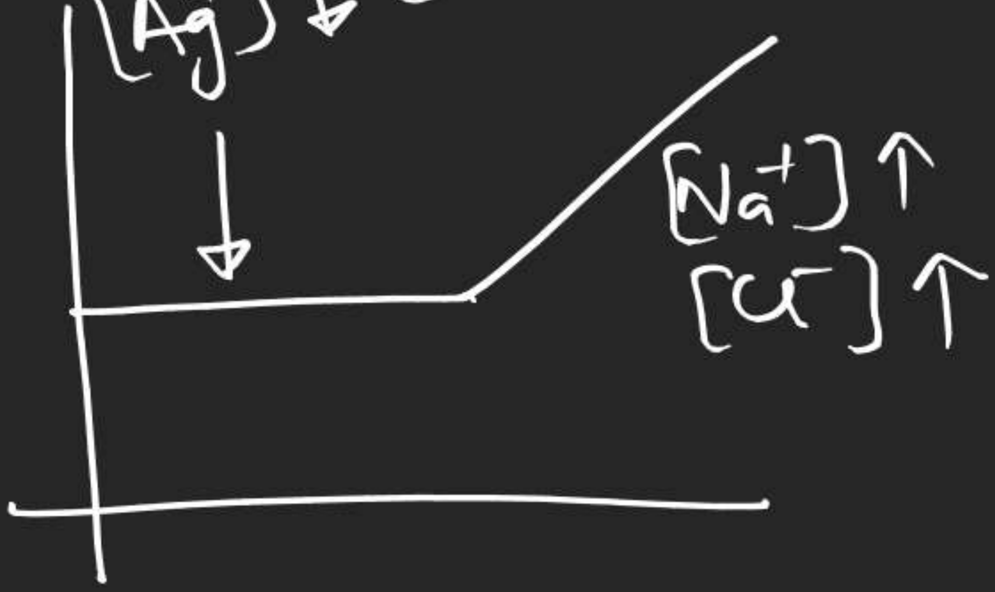
ppt Rxn

$AgNO_3 + NaCl$

$[Ag^+] \downarrow$ $[Na^+] \uparrow$



Ag^+	NO_3^-	Na^+	Cl^-
1	1	0	0
1	1	0.1	0.1
0.9	1	0.1	0

0 – II 1 – 14

J – M 1 – 20

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$$\frac{\Lambda_{eq}}{\Lambda_{eq}^{\infty}} = \alpha = \frac{10}{200}$$

0.1 M HA

$$[H^+] = C\alpha$$
$$= 0.1 \times 1/20$$

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$$\Lambda_m = ?$$

$$K_a = C\alpha^2$$
$$1.6 \times 10^{-5} = 0.01 \times \alpha^2$$
$$\alpha = 0.04$$

$$\Lambda_m = \alpha \times \Lambda_m^{\infty}$$
$$= 0.04 \times 380 \times 10^{-4}$$
$$= 1.52 \times 10^{-3} = \frac{K}{1000 \times 0.01}$$
$$=$$

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$$\Lambda_m^{\infty} = \Lambda_{eq}^{\infty} \times n\text{-factor}$$
$$= 1.5 \times 10^{-4} \times 3$$
$$= 4.5 \times 10^{-4} = \frac{9 \times 10^{-6}}{1000 \times S}$$

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