



Initially 1 0 0

After dissociation $a - \alpha$ α 2α

$$\text{Total} = 1 - \alpha + \alpha + 2\alpha = 1 + 2\alpha$$

$$\alpha = \frac{1.98-1}{\alpha} = \frac{0.98}{\alpha} = 0.49$$

for a mole $\alpha = 0.49$

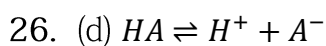
$$\text{For 0.01 mole } \alpha = \frac{0.49}{0.01} = 49$$

22. (c) It is an ionic salt.

23. (b) Due to common ion effect of H^+ .

24. (d) Current does not affect the degree of ionization.

25. (c) Polar solvent facilitate ionisation of strong electrolytes due to dipole-ion attraction.



$$K = Ca^2 = 0.1 \times (10^{-4})^2 = 10^{-9}$$

27. (d) $\sqrt{K_a \cdot c}$

For a weak acid, dissociation is very small.

So we use the approximation:



Dissociation is small \Rightarrow

Let initial concentration = c

Let $x = [H^+]$ at equilibrium

Then:

$$K_a = \frac{(x \times x)}{(c - x)}$$

Since x is very small, we take $c - x \approx c$

So:

$$K_a \approx \frac{x^2}{c}$$

Therefore:

$$x = \sqrt{K_a \times c}$$

And $x = [H^+]$, so:

$$[H^+] = \sqrt{K_a \cdot c}$$

28. (d) Degree of dissociation $\alpha = ?$

$$\text{Normality of solution} = 0.1 \text{ N} = \frac{1}{10} \text{ N}$$

$$\text{Volume} = 10 \text{ litre}$$

$$\text{Dissociation constant } K = 1 \times 10^{-5}$$

$$K = \frac{\alpha^2}{v}; \alpha = \sqrt{KV} = \sqrt{1 \times 10^{-5} \times 10}; \alpha = 1 \times 10^{-2}$$

29. (d) $MgCl_2 \rightleftharpoons Mg^{++} + 2Cl^-$ in aqueous solution it is dissociated into ions.

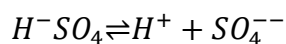
30. (c) Ostwald's dilution formula is $\alpha^2 = K(1 - \alpha)/C$ but for weak electrolyte α is

very small. So that $(1 - \alpha)$ is neglected for weak electrolytes. So for weak

electrolyte the dilution formula is $\alpha = \sqrt{\frac{K}{c}}$.



31. (b) $K_a = C\alpha^2 = 0.2 \times \left(\frac{32}{100}\right)^2 = 2.048 \times 10^{-4}..$ (c) $H_2SO_4 \rightleftharpoons H^+ +$



Because of it is completely ionised.

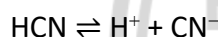
33. (c) Colour of electrolyte depends on the nature of both ions.

e.g. $CuSO_4$ is blue because Cu^{2+} ions are blue.

34. (c) Ionisation depends upon dilution, when dilution increases then ionisation is also increased.

35. (a) More is K_a , lesser is pK_a ($pK_a = -\log K_a$) more is acidic strength.

36. For weak acid dissociation:



Let dissociation = x

So,

$$[H^+] = x$$

$$[CN^-] = x$$

Remaining HCN ≈ 0.1 M

Using the formula:

$$K_a = (x \times x) / 0.1$$

$$\Rightarrow x^2 = K_a \times 0.1$$

$$\Rightarrow x = \sqrt{(4 \times 10^{-10} \times 0.1)}$$

$$\Rightarrow x = \sqrt{(4 \times 10^{-11})}$$

$$\Rightarrow x = 2 \times 10^{-5.5}$$

$$10^{-5.5} \approx 3.162 \times 10^{-6}$$

So,

$$x = 2 \times 3.162 \times 10^{-6}$$

$$x = 6.324 \times 10^{-6} \text{ M}$$

$$\approx 6.3 \times 10^{-6} \text{ M}$$

Final Answer: (c) $6.3 \times 10^{-6} \text{ M}$

