

PUFRI

ŠIBKA KISLINA IN SOL NJENE KONJUGIRANE BAZE



$$K_a = \frac{[\text{H}_3\text{O}^+] \cdot [\text{A}^-]}{[\text{HA}]} = \frac{x \cdot (c_{o(S)} + x)}{c_{o(K)} - x}$$

Predpostavka (ki jo, ko izračunamo x preverimo)

$$\frac{x}{c_{o(K)}}, \frac{x}{c_{o(S)}} \leq 0,01 \Rightarrow K_a \approx \frac{x \cdot c_{o(S)}}{c_{o(K)}} = \frac{x \cdot n_{o(S)}}{n_{o(K)}}$$

$$[\text{H}_3\text{O}^+] = x = \frac{K_a \cdot c_{o(K)}}{c_{o(S)}} = \frac{K_a \cdot n_{o(K)}}{n_{o(S)}}$$

$$\text{pH} = -\log[\text{H}_3\text{O}^+] = -\log(x) = -\log\left(\frac{K_a \cdot c_{o(K)}}{c_{o(S)}}\right) = -\log\left(\frac{K_a \cdot n_{o(K)}}{n_{o(S)}}\right)$$

↓

$$c_{o(K)} = c_{o(S)}; n_{o(K)} = n_{o(S)} \Rightarrow K_a \approx x$$

$$[\text{H}_3\text{O}^+] = x = K_a$$

$$\text{pH} = -\log[\text{H}_3\text{O}^+] = -\log(x) = -\log(K_a) = \text{p}K_a$$

Legenda:

$c_{o(K)}$ – koncentracija kisline v raztopini

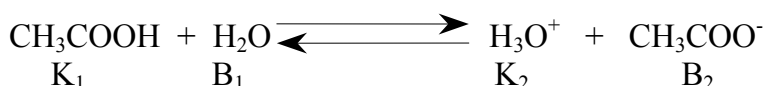
$c_{o(S)}$ – koncentracija konjugirane baze (soli) v raztopini

$n_{o(K)}$ – množina kisline v raztopini

$n_{o(S)}$ – kmnožina konjugirane baze (soli) v raztopini

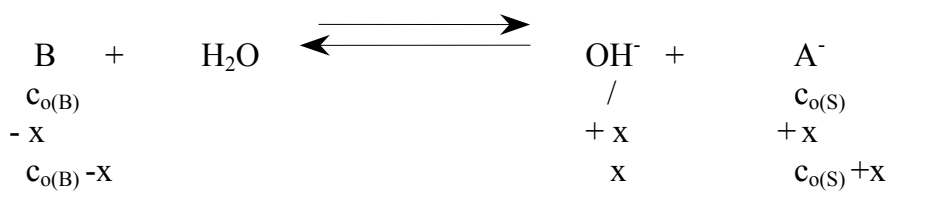
K_a – ravnotežna koncentracijska konstanta disociacije kisline

Primer: Protolitska reakcija očetne kisline = Elektrolitska disociacija očetne kisline



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ŠIBKA BAZA IN SOL NJENE KONJUGIRANE KISLINE



$$K_b = \frac{[OH^-] \cdot [BH^+]}{[B]} = \frac{x \cdot (c_{o(S)} + x)}{c_{o(B)} - x}$$

Predpostavka (ki jo, ko izračunamo x preverimo)

$$\frac{x}{c_{o(B)}}, \frac{x}{c_{o(S)}} \leq 0,01 \Rightarrow K_b \approx \frac{x \cdot c_{o(S)}}{c_{o(B)}} = K_b \approx \frac{x \cdot n_{o(S)}}{n_{o(B)}}$$

$$[OH^-] = x = \frac{K_b \cdot c_{o(B)}}{c_{o(S)}} = \frac{K_b \cdot n_{o(B)}}{n_{o(S)}}$$

$$pOH = -\log[OH^-] = -\log(x) = -\log\left(\frac{K_b \cdot c_{o(B)}}{c_{o(S)}}\right) = -\log\left(\frac{K_b \cdot n_{o(B)}}{n_{o(S)}}\right)$$

$$pH = 14 - pOH$$

↓

$$c_{o(B)} = c_{o(S)}; n_{o(B)} = n_{o(S)} \Rightarrow K_b \approx x$$

$$[OH^-] = x = K_b$$

$$pOH = -\log[OH^-] = -\log(x) = -\log(K_b) = pK_b$$

Legenda:

c_{o(B)} – koncentracija baze v raztopini

c_{o(S)} – koncentracija konjugirane kisline (soli) v raztopini

n_{o(B)} – množina baze v raztopini

n_{o(S)} – množina konjugirane kisline (soli) v raztopini

K_b – ravnotežna koncentracijska konstanta disociacije baze

Primer:

Protolitska reakcija amoniaka = Elektrolitska disociacija amoniaka

