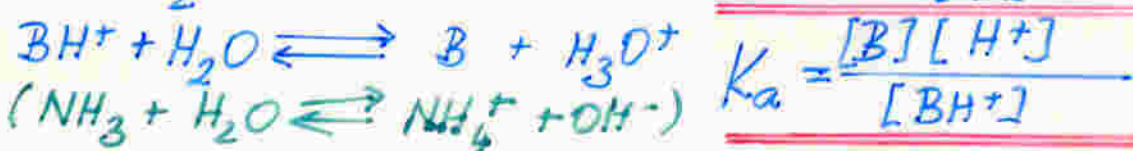
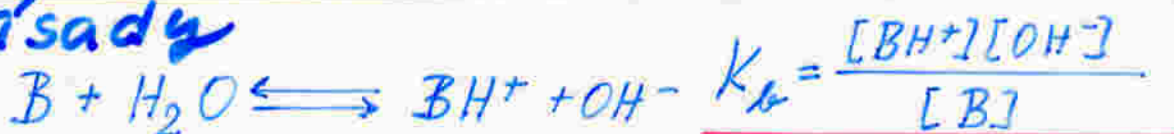


základy



látková bilance: $c_B = [BH^+] + [B]$; $[OH^-] = [BH^+] + [H^+]$

$$\Rightarrow [BH^+] = [OH^-] - [H^+]$$

$$\Rightarrow [B] = c_B - [BH^+] \Rightarrow [B] = c_B - [OH^-] + [H^+]$$

$$[OH^-] = K_b \cdot \frac{[B]}{[BH^+]} = K_b \cdot \frac{c_B - [OH^-] + [H^+]}{[OH^-] - [H^+]}$$

zanedbání: $[H^+] \ll [OH^-]$

$$[OH^-] = K_b \cdot \frac{c_B - [OH^-]}{[OH^-]} \Rightarrow [OH^-]^2 + K_b [OH^-] - K_b \cdot c_B = 0$$

$$[OH^-] = \frac{-K_b}{2} + \sqrt{\frac{K_b^2}{4} + K_b \cdot c_B} \quad ; \quad \text{zanedbání: } [OH^-] \ll c_B \Rightarrow$$

$$[OH^-] = K_b \cdot \frac{c_B}{[OH^-]} \Rightarrow [OH^-] = \sqrt{c_B \cdot K_b} \quad ; \quad [H^+][OH^-] = K_w \Rightarrow$$

$$[H^+] = \frac{K_w}{\sqrt{c_B \cdot K_b}} \Rightarrow \log [H^+] = \log K_w - \frac{1}{2} \log c_B - \frac{1}{2} \log K_b$$

$$\Rightarrow pH = 14 - \frac{1}{2} (pK_b - \log c_B)$$

Kritéria pro zjednodušení:

$$pH(\text{skutečné}) - pH(\text{z měření}) = \pm 0,02$$

$$\log [H^+](\text{změř.}) - \log [H^+](\text{skut.}) = \pm 0,02$$

$$[H^+](\text{změř.}) / [H^+](\text{skut.}) = 1,05 - 0,95 (\pm 5\%)$$