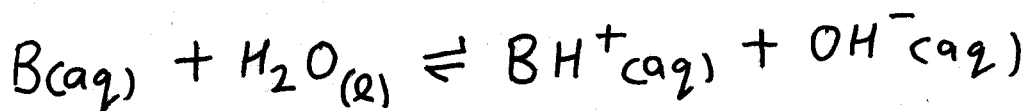
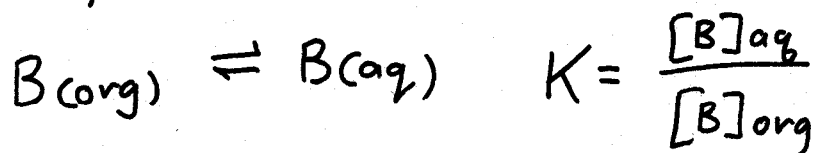


Now consider extracting a weakly basic analyte B from an organic matrix into H<sub>2</sub>O:



$$K_b = \frac{[\text{BH}^+]_{\text{aq}} [\text{OH}^-]_{\text{aq}}}{[B]_{\text{aq}}}$$

As always,  $q = \frac{V_1}{V_1 + DV_2}$

Here,  $D = \frac{[B]_{\text{aq}} + [\text{BH}^+]_{\text{aq}}}{[B]_{\text{org}}}$  (i.e. assume  $[\text{BH}^+]_{\text{org}} = 0$ )

$$D = \frac{[B]_{\text{aq}}}{[B]_{\text{org}}} + \frac{[\text{BH}^+]_{\text{aq}}}{[B]_{\text{org}}} \quad \rightarrow \quad \frac{1}{[B]_{\text{org}}} = \frac{K}{[B]_{\text{aq}}}$$

Substituting,

$$D = K + \frac{[\text{BH}^+]_{\text{aq}}}{[B]_{\text{aq}}} K$$

↑ using  $K_b$  eqn...

$$D = K + K \frac{K_b}{[\text{OH}^-]_{\text{aq}}}$$

Contrast Harris p. 503