(6) Selectivity and selectivity coefficient of IERs

When one adds the IER that has ions "B", an ionic valence of which is Z_A, as its fixed ions into the solutions of ions "A", an ionic valence of which is z_A, the exchange between ions "A" and ions "B" occurs. This exchange reaction is an equilibrium reaction written in Eq. I-3-6.

$$z_A\overline{B^{z_B}} + z_B A^{z_A} \rightleftarrows z_B\overline{A^{z_A}} + z_A B^{z_B} \qquad \text{(I-3-6)}$$

The separation factor, the selectivity coefficient and the distribution coefficient are expressed in the following equations; Eqs.I-3-7 ~ I-3-9.

Separation factor $$\alpha_B^A = \frac{\dfrac{[\overline{A}]}{[\overline{B}]}}{\dfrac{[A]}{[B]}} \qquad \text{(I-3-7)}$$

Selectivity coefficient $$K_B^A = \frac{[\overline{A}]^{z_B} \cdot [B]^{z_A}}{[\overline{B}]^{z_A} \cdot [A]^{z_B}} \qquad \text{(I-3-8)}$$

Distribution coefficient $$\alpha = \frac{[\overline{A}]}{[A]} \qquad \text{(I-3-9)}$$