- For dissociation of solute:

Consider an electrolyte, A_xB_y which partially dissociates in solution yielding x ions of A^{y+} and y ions of B^{x-} and if α is the degree of dissociation and c is the initial concentration of the solute, then we can write

$$A_xB_y \rightleftharpoons xA^{y+} + yB^{x-}$$

Initial concentration:	C	0	0
Concentration at equilibrium:	$C-C\alpha$	$x.C\alpha$	$y.C\alpha$

$\therefore$ Total moles at equilibrium $= C - C\alpha + Cx\alpha + Cy\alpha$

$$= C[1 - \alpha + x\alpha + y\alpha]$$

~~$= C[1 - \alpha(1 - x - y$~~

$$= C[1 + x\alpha + y\alpha - \alpha]$$

$$= C[1 + \alpha(x + y - 1)]$$

Hence, $i = \dfrac{\text{No. of moles after dissociation}}{\text{No. of moles for no dissociation}}$

or, $i = \dfrac{C[1 + \alpha(x+y-1)]}{C}$

or, $i = 1 + \alpha(x+y-1)$

or, $i - 1 = \alpha(x+y-1)$