

### 3.2 Quantitative approach for changes of $p$

Using Eq. (3.9) and taking into account that in the left hand side of Eq. (3.8)  $\Delta_r G^0$  is independent of  $p$  (since  $G^0$  is the standard potential at 1 bar), i.e.  $K_p$  is independent of pressure, we find

$$\left(\frac{\partial \ln(K_p)}{\partial p}\right)_T = 0 = \left(\frac{\partial \ln(K_x)}{\partial p}\right)_T + \frac{\partial}{\partial p} \left( \sum_i \ln \left( \frac{p_{tot}}{p^0} \right)^{\nu_i} \right) \Rightarrow \left(\frac{\partial \ln(K_x)}{\partial p}\right)_T = -\frac{\sum_i \nu_i}{p_{tot}} \quad (3.10)$$

So if  $\sum_i \nu_i = 0$  holds  $K_x$  is independent of  $p$ , but if e.g.  $\sum_i \nu_i > 0$  and  $\Delta p > 0$  than  $K_x$  becomes smaller, i.e. we have less reaction products.