

Quiz 4

Consider the reaction described by:



This reaction proceeds at  $T = 500 \text{ K}$  and  $P = 1 \text{ bar}$  and initial contains 1 mol each of  $\text{Cl}_2(\text{g})$  and  $\text{Br}_2(\text{g})$ . How will the point of equilibrium change if the pressure is increased to 100 bar?

Answer the question both qualitatively and quantitatively.

$$\Delta G_f^\circ(\text{BrCl}) = -53.7 \text{ kJ mol}^{-1}.$$

Qualitatively: Le Chatelier says that because there are two moles of gas on both sides of the equation, changing pressure will have no effect.

Quantitatively:  $k_p = K_x P_{\text{Tot}}^{\sum \nu_i} = K_x P_{\text{Tot}}^{2-1-1} = K_x P_{\text{Tot}}^0$

$$k_p = K_x (1)$$

So  $K_x$  doesn't need to change to keep  $k_p$  constant