



Equilibrium Constant

Things to KNOW when calculation Chemical Equilibrium



1. Balance the equation
2. Solids and aqueous solutions are not included in calculations
3. TEMPERATURE must be kept constant

$$K_c = \frac{\text{Products}}{\text{Reactants}}$$

$$K_c = \frac{[C]^c [D]^d}{[A]^a [B]^b}$$

4. ONLY ROUND OFF YOUR FINAL ANSWER

Example 1

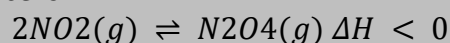
1. Write the K_c expression for the following $Cu(s) + 2Ag^+(aq) \leftrightarrow Cu^{2+}(aq) + 2Ag(s)$
2. Calculate the value of K_c given the following: Initially, a mixture of $0,100 \text{ mol. dm}^{-3} NO$; $0,050 \text{ mol. dm}^{-3} H_2$; $0,100 \text{ mol. dm}^{-3} H_2O$ was allowed to reach equilibrium. At equilibrium, the concentration of NO is found to be $0,062 \text{ mol. dm}^{-3}$. Determine the value of K_c assuming that temperature is kept constant.

	<i>NO</i>	<i>H₂</i>	<i>N₂</i>	<i>H₂O</i>
Ratio				
Initial concentration				
Change in concentration				
Equilibrium concentration				

$$K_c = \frac{\text{Products}}{\text{Reactants}}$$

Example 2

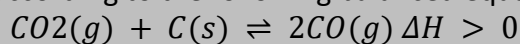
1. A certain amount of nitrogen dioxide gas (NO_2) is sealed in a gas syringe at $25\text{ }^\circ C$. When equilibrium is reached, the volume occupied by the reaction mixture in the gas syringe is 80 cm^3 . The balanced chemical equation for the reaction taking place is:



At equilibrium the concentration of the $NO_2(g)$ is $0,2\text{ mol} \cdot \text{dm}^{-3}$. The equilibrium constant for the reaction is 171 at $25\text{ }^\circ C$.

Calculate the initial number of moles of $NO_2(g)$ placed in the gas syringe

2. Carbon dioxide reacts with carbon in a closed system to produce carbon monoxide, $CO(g)$, according to the following balanced equation:



Initially an unknown amount of carbon dioxide is exposed to hot carbon at $800\text{ }^\circ C$ in a sealed 2 dm^3 container. The equilibrium constant, K_c , for the reaction at this temperature is 14. At equilibrium it is found that $168,00\text{ g}$ carbon monoxide is present.

Calculate the initial amount (in moles) of $CO_2(g)$ present.