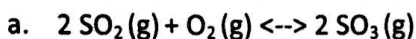
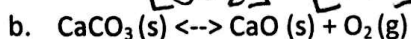


Equilibrium Practice

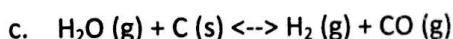
1. Write the equilibrium expression, K_c , for the following reactions:



$$K_c = \frac{[\text{SO}_3]^2}{[\text{SO}_2]^2 [\text{O}_2]}$$



$$K_c = [\text{O}_2]$$



$$K_c = \frac{[\text{CO}][\text{H}_2]}{[\text{H}_2\text{O}]}$$

2. Calculate K_c for the following reaction if you have 0.1908 moles of CO_2 , 0.0908 moles of H_2 , 0.0092 moles of CO , and 0.0092 moles of H_2O in a 2.00 L reaction vessel at equilibrium.

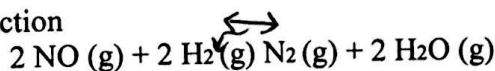


$$K_c = \frac{[\text{CO}][\text{H}_2\text{O}]}{[\text{CO}_2][\text{H}_2]}$$

Concentrations are in molarity, (moles/liter).
Therefore... divide all moles by 2 L.

$$K_c = \frac{\left[\frac{0.0092}{2}\right]\left[\frac{0.0092}{2}\right]}{\left[\frac{0.1908}{2}\right]\left[\frac{0.0908}{2}\right]} = \frac{[0.0046][0.0046]}{[0.0954][0.0454]} = \frac{0.00002116}{0.0043316} = \boxed{4.9 \times 10^{-3}}$$

3. Consider the following reaction



Determine the value of the equilibrium constant, K_c , for the reaction. At equilibrium, you have a mixture of 0.100 M NO , 0.050 M H_2 , 0.100 M H_2O , and 0.050 M N_2 .

$$K_c = \frac{[\text{H}_2\text{O}]^2 [\text{N}_2]}{[\text{NO}]^2 [\text{H}_2]^2} = \frac{[0.100]^2 [0.050]}{[0.100]^2 [0.050]^2} = \frac{(0.01) \times (0.050)}{(0.01) \times (0.0025)} = \frac{0.0005}{0.000025} = \boxed{20}$$

this would never really happen... focus on how we got here!

4 ~~11~~ What is LeChatlier's Principle?

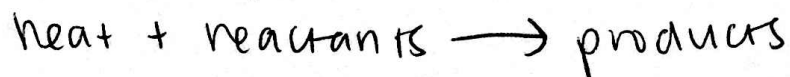
If a system experiences a stress or a shift in equilibrium, it will shift to counteract that stress and restore equilibrium.

5 ~~10~~ According to LeChatlier's principle, what would happen if you increase the reactant concentration in a reaction at equilibrium?

The equilibrium reaction will favor the forward reaction to make more products.

6 ~~11~~ According to LeChatlier's principle, what would happen if you added heat to an endothermic reaction?

endothermic:



It will shift towards products because heat is a "reactant".



not literally...
but we put heat IN
an endothermic rxn...
so for this purpose we can
write it as above.