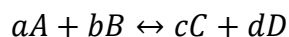


Answer on Question #67809 - Chemistry - General Chemistry

Question: What does it mean when the equation says that your equilibrium constant at 500 K is, for example, 1.671×10^4 ?

Answer: The equilibrium constant shows the numerical value of the correlation between the equilibrium concentrations of the reaction products and the reagents. For example, for the reaction (where a, b, c, d are coefficients in the reaction equation)



the expression for the equilibrium constant will be the following:

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

It is clear that the bigger value of the equilibrium constant is, the bigger is the relation between the equilibrium concentrations of the products to the concentration of the reagents. By the value of K_{eq} we can predict the direction of the reaction with the initial concentrations of all components given. For example, if we put the initial concentrations of products and reagents into the expression for K_{eq} and obtain the value smaller than K_{eq} , it means that the reaction will move towards the formation of products to reach equilibrium, and in opposite situation if we obtain value bigger than K_{eq} , it means that the reaction will move towards the decomposition of products and formation of reagents. In your case the big value of the equilibrium constant means that at the given conditions the products of the reaction are thermodynamically highly more preferable than the reagents, and in your system at equilibrium there will be rather low concentrations of the reagents left and high concentrations of the products (if you put some amounts of the reagents according to the reaction stoichiometry into the reactor, they will mostly convert into products).

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