Answer on Question #67013, Chemistry, General Chemistry

Is it correct in the ( ) ?

1. In the system: $2NO_2 = N_2O_4 + Q$ H<0; a chemical equilibrium is reached. An increase in temperature will cause a shift to the (left), because the reverse reaction is (increasing). If concentration of NO_2 is increased, the (forward) reaction will speed up, if total pressure is decreased the volume of the system should increase, the (reverse) reaction will be preferred.

Solution:

The first explanation is correct, because if H<0, the chemical reaction is exothermic (it means the heat of products higher than reagents) that's why an increase in temperature will cause a shift to the left, according to Le Chatelier's principle. According to reaction, number of moles of reagents more than number of moles of products, thus, if concentration of NO_2 is increased, the forward reaction will speed up, if total pressure is decreased the volume of the system should increase, the reverse reaction will be preferred (again according to Le Chatelier's principle).

2.Rate of reation is the change in (concentration) of a reactant or product per time unit. For a chemical reaction: nA + mB --> C + D the rate equation or rate law is given by (chemical kinetics). Main factors that affect the reaction rate are concentration and temperature. The higer the reactant's concentration, the (faster) the reaction rate. Usually, an increase in temperature is accompanied by (an increase) in the reaction rate.

Solution:

For chemical reaction:

nA + mB --> C + D
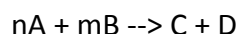
the formula, which describes the rate of the chemical reaction is (using law of mass action)

$v = k \cdot C(A)^n \cdot C(B)^m$, where k is rate constant, C is concentrations for reagents A and B.

So, according to the last equation, the higer the reactant's concentration, the faster the reaction rate. And an increase in temperature is accompanied by an increase in the reaction rate (because the movement of reactants particles is higher and that's why we have more effective collisions between this particles).