K_p

(1) When A is heated in a closed system to 400°C, the following equilibrium is set up:

$$A_{(g)} \rightleftharpoons B_{(g)} + C_{(g)}$$

The equilibrium partial pressures of the three gases were found to be: A 5.1 kPa B 95 kPa C 95 kPa. Calculate K_p at this temperature.

② This refers to the equilibrium $N_2O_4(g) \rightleftharpoons 2NO_2(g)$

A vessel containing only dinitrogen tetraoxide was held at a temperature of 350k until equilibrium was established. The equilibrium pressure was 123 kPa and the mole fraction of nitrogen dioxide was found to be 0·800. Calculate the value of K_p at this temperature.

(3) A mixture of nitrogen and hydrogen in the mole ratio 1:3 (as required by the equation) was heated to 700K and a pressure of 79 atmosphere in the presence of an iron catalyst. The equilibrium mixture was found to contain the following proportions of gases (by volume): N_2 21%, H_2 63%, NH_3 16%. Calculate the value for K_p at this temperature.

$$N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$$

(4) A mixture of nitrogen and hydrogen in the mole ratio 1:3 (as required by the equation) was heated to 700K and a pressure of 79 atmosphere in the presence of an iron catalyst. The equilibrium mixture was found to contain 16% of ammonia by volume. Calculate the value for K_p at this temperature.

⑤ Hydrogen and Iodine were heated in a closed container at 1100k until equilibrium was reached:

$$H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)}$$

The equilibrium partial pressures were hydrogen 50kPa; iodine 50kPa; and the total equilibrium pressure was 350kPa. find K_p.

(6) 0·200 moles of dinitrogen tetroxide, N_2O_4, were allowed to reach equilibrium at 25°C according to the equation:

$$N_2O_{4(g)} \rightleftharpoons 2NO_{2(g)}$$

The equilibrium mixture contained 4·60g of nitrogen dioxide and the equilibrium pressure was 0·431 atmospheres. find k_p at 25°C.

(7) $N_2O_{4(g)} \rightleftharpoons 2NO_{2(g)}$ $\quad K_P = 3.89\ atm$

When the above equilibrium was established at 350 K, the partial pressure of N_2O_4 was found to be 0.200 atm. Calculate the partial pressure of the NO_2, and the total pressure.

(8) $N_2O_{4(g)} \rightleftharpoons 2NO_2$ $K_p = 3.89 atm$ @ 350K

When 1.00mole of dinitrogen tetroxide was heated to 350K in a closed container, the equilibrium mixture was found to contain 0.600mole of nitrogen dioxide. Calculate the total pressure at equilibrium, and the partial pressures of N_2O_4 and NO_2.