## Answer on Question #45022, Chemistry, Inorganic Chemstry

### Question

The value of the equilibrium constant for the reaction 2COF2 (g) ↔ CO2 (g) + CF4 (g) is Keq = 2. If the reaction container currently holds 1 mole each of CO2 and CF4 and 0.5 mole of COF2, then what will happen?

### Solution

$$2COF_2\ (g) \leftrightarrow CO_2\ (g) + CF_4\ (g)$$

$$k(\text{forward reaction}) = c(COF_2)^2 = 0.52 = 0.25$$

$$k(\text{reverse reaction}) = c(CO_2) \cdot c(CF_4) = 1 \cdot 1 = 1$$

$$K_{eq} = k(\text{reverse reaction})/k(\text{direct reaction}) = [CO_2] \cdot [CF_4]/[\ COF_2]^2 = 2$$

But in the considered case:

$$k(\text{reverse reaction})/k(\text{direct reaction}) = 1/0.25 = 4$$

Therefore the concentrations of $CO_2$ and $CF_4$ will decrease while the concentration of $COF_2$ will increase.

**Answer**: the reaction will proceed in reverse direction.