Answer on Question #70647 – Chemistry – Other

Task:

In a reversible reaction $CO_2 + H_2 = H_2O + CO$, the concentration of CO_2 is 0.70 mole/dm^3 and of H_2 is 80.38 mole/dm^3 and the concentrations of CO and H_2O are each 9.46 mole/dm^3. What is the value of the equilibrium constant K.

A) 0.168;

B) 0.233;

C) 0.628;

D) 1.591.

Solution:

Reaction equation:

$$CO_2 + H_2 = CO + H_2O$$

The expression for the equilibrium constant:

$$K = \frac{[H_2O]*[CO]}{[H_2]*[CO_2]};$$

Then,

$$K = \frac{[H_2O]*[CO]}{[H_2]*[CO_2]} = \frac{9.46\,mole/dm^3 * 9.46\,mole/dm^3}{80.38\,mole/dm^3 * 0.70\,mole/dm^3} = 1.5905;$$

Answer: D) 1.591.