3. Consider the equilibrium system below.

$$N_2(g) + O_2(g) \rightleftharpoons 2\,NO(g)$$

If the equilibrium constant (K) for this reaction is 4.1×10^{-31}, which one of the following statements is **true** for the system where the initial partial pressures of nitrogen and oxygen were equal to each other?

(a) Once equilibrium is reached, the reverse reaction rate is much faster than the forward reaction rate.
(b) The partial pressure of NO(g) is less than the partial pressure of $N_2(g)$.
(c) The actual ratio of gaseous N_2 particles to NO gaseous particles is 1:2.
(d) When nitrogen gas is injected into a vessel containing mostly oxygen gas, the partial pressure of oxygen decreases dramatically.