Answer on Question #76717 – Chemistry – Other

Task:

Consider the following reaction at equilibrium:

$C(s) + H_2O\ (g) <--> CO\ (g) + H_2\ (g)$

Which of the following conditions will increase the partial pressure of CO?
A) decreasing the partial pressure of H_2O (g);
B) removing H_2O (g) from the system;
C) decreasing the volume of the reaction vessel;
D) decreasing the pressure in the reaction vessel;
E) increasing the amount of carbon in the system.

Solution:

A) **Wrong.** By Le Chateliers principle equilibrium will adjust to oppose the change, produce more H_2O, reducing CO.
B) **Wrong.** Same explanation as for A.
C) **Wrong.** Decreasing volume equivalent to increasing pressure, by Le Chatelier this is opposed by system decreasing its volume, ie equilibrium shifts to left, more H_2O and less CO (and H_2).
D) **Correct**. By Le Chatelier equilibrium shifts to right, to produce a larger volume of gas so opposing the pressure decrease.
E) **Wrong.** The C in the solid state (has a constant and small vapour pressure) is irrelavent to the equilibrium in the gaseous phase.

Answer: D) decreasing the pressure in the reaction vessel.