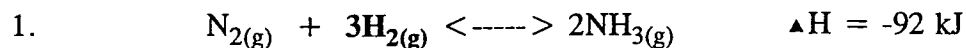


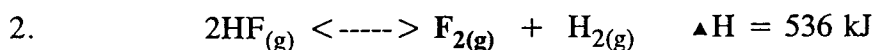
key:

Equilibrium #3

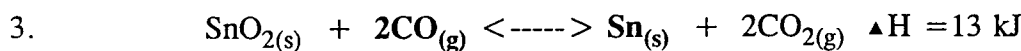
Describe how each of the following changes listed below each equation will affect the amount of substance that is **highlighted**.



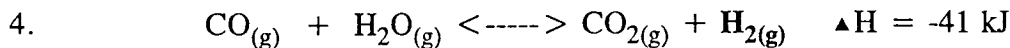
- (a) increase the $[\text{N}_2]$ *decreases* $[\text{H}_2]$
- (b) increase the temperature *increases* $[\text{H}_2]$
- (c) increase the volume *increases* $[\text{H}_2]$
- (d) increase the pressure by changing volume *decreases* $[\text{H}_2]$



- (a) decrease the temperature *decreases* $[\text{F}_2]$
- (b) decrease the $[\text{H}_2]$ *increases* $[\text{F}_2]$
- (c) decrease the amount of HF at constant volume *decreases* $[\text{F}_2]$
- (d) decrease the volume *no effect* (2 mol of gas on each side)
- (e) increase the partial pressure of $\text{H}_{2(g)}$ *decreases* $[\text{F}_2]$



- (a) increase the temperature *decreases* $[\text{CO}]$
- (b) increase the $[\text{CO}_2]$ *increases* $[\text{CO}]$
- (c) add a catalyst *no effect*
- (d) add $\text{Kr}_{(g)}$ at constant volume *no effect*
- (e) add $\text{Kr}_{(g)}$ at constant pressure *no effect* (2 mol of gas on each side)
- (f) add SnO_2 *no effect - solids don't affect eqm*



- (a) add CO_2 *decrease* $[\text{H}_2]$
- (b) increase the temperature *decrease* $[\text{H}_2]$
- (c) remove some H_2O *decrease* $[\text{H}_2]$
- (d) decrease the pressure by changing the volume *no effect* (2 mol of gas on each side)
- (e) add CO *increase* $[\text{H}_2]$
- (f) add a catalyst *no effect*
- (g) adding a catalyst. *no effect*