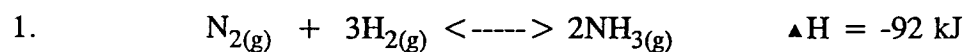


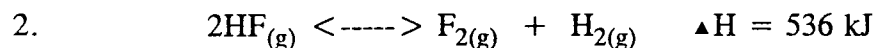
Key.

Equilibrium #2

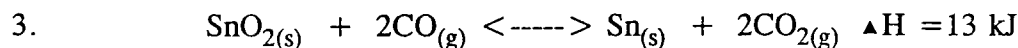
Describe the effect on the equilibrium when the following changes take place for each reaction.



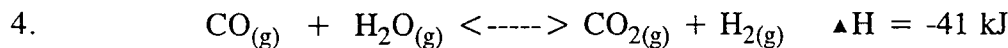
- (a) increase the $[\text{N}_2]$ \longrightarrow shifts to products
- (b) increase the temperature \longleftarrow shifts to reactants
- (c) increase the volume \longleftarrow shifts to reactants
- (d) increase the pressure by changing volume \longrightarrow shifts to products



- (a) decrease the temperature \longleftarrow shifts to reactants
- (b) decrease the $[\text{H}_2]$ \longrightarrow shifts to products
- (c) decrease the amount of HF at constant volume \longleftarrow shifts to reactants
- (d) decrease the volume no change (2 mols of gas on each side)
- (e) increase the partial pressure of $\text{H}_2(\text{g})$ \longleftarrow shifts to reactants



- (a) increase the temperature \longrightarrow shifts to products
- (b) increase the $[\text{CO}_2]$ \longleftarrow shifts to reactants
- (c) add a catalyst no change
- (d) add $\text{Kr}(\text{g})$ at constant volume no change
- (e) add $\text{Kr}(\text{g})$ at constant pressure no change (2 mols of gas on each side)
- (f) add SnO_2 solids do not change the position of equilibrium (more to come on this)



- (a) add CO_2 \longleftarrow shifts to reactants
- (b) increase the temperature \longleftarrow shifts to reactants
- (c) remove some H_2O \longleftarrow shifts to reactants
- (d) decrease the pressure by changing the volume no change (2 mols of gas on each side)
- (e) add CO \longrightarrow shifts to products
- (f) add a catalyst no change
- (g) adding a catalyst. no change.