Le Chatelier's Principle NAME_____

Which way will the equilibrium shift when each of the following changes is made to the system at equilibrium?

2 mol gas 2 mol gas

$$50\ kcal + NO_2(g) + CO(g) \rightleftharpoons CO_2(g) + NO(g)$$

1. Increase [NO] ←
2. Increase the pressure no shift
3. Add a catalyst no shift
4. Increase [CO] →
5. Decrease temperature ←
6. Decrease $[CO_2]$ →
7. Increase the volume of the container no shift

P ↓

0 mol gas 1 mol gas

Heat + $2\ H_2O_2(aq) \rightleftharpoons 2\ H_2O(l) + O_2(g)$ $\Delta H = +15$ kcal

Endo

1. Increase the temperature →
2. Increase $[H_2O]$ no shift
3. Increase $[H_2O_2]$ →
4. Increase the pressure ←
5. Increase the partial pressure of O_2 ←
6. Decrease the volume ←

P ↑

3 mol gas 3 mol gas

$$Fe_2O_3(s) + 3\ H_2(g) \rightleftharpoons 3\ H_2O(g) + 2\ Fe(s) + 36.3\ kcal$$

1. Increase [Fe] no shift
2. Increase the temperature ←
3. Increase the pressure no shift
4. Decrease $[H_2O]$ →
5. Decrease the partial pressure of H_2 ←
6. Add a sample of Ne gas no shift

E+O

$$2\ K^+(aq) + SO_4^{2-}(aq) \rightleftharpoons K_2SO_4(s) \quad \Delta H = -200\ kcal$$

P ↑

1. Decrease the pressure no shift
2. Add $BaCl_{2(aq)}$ ←
3. Increase $[SO_4^{2-}]$ →
4. Decrease $[K^+]$ ←
5. Decrease the volume no shift
6. Add K_2SO_4 (solid) no shift
7. Decrease temperature →

$BaSO_4$ will precipitate lowers $[SO_4^{2-}]$