**Le Chatelier’s Principle**

<https://www.youtube.com/watch?v=4-fEvpVNTlE>

1. Citric acid is a weak acid that ionizes to form hydronium (H3O+) ions and citrate (C6H7O7-) ions. The reaction is:

C6H8O7 + H2O ↔ C6H7O7-(aq) + H3O+(aq)

Suppose that we add sodium citrate to the solution at equilibrium; this increases the concentration of citrate ions. This disturbance will:

1. Shift the equilibrium to the left
2. Shift the equilibrium to the right
3. There will be no effect
4. One result of this shift on equilibrium will be to:
5. Increase the concentration of un-ionized citric acid
6. Increase the concentration of citrate ions
7. Increase the concentration of hydronium ions
8. A common equilibrium reaction in the gas phase is the dimerization of NO2:

2NO2(g)↔N2O4(g)

Suppose we add more to the reaction mixture at equilibrium. The disturbance will:

1. Shift the equilibrium to the left
2. Shift the equilibrium to the right
3. There will be no effect
4. If we increase the pressure in the system, the disturbance will:
5. Shift the equilibrium to the left
6. Shift the equilibrium to the right
7. There will be no effect
8. One result of the shift in equilibrium will be to:
9. Increase the concentration of N2O4
10. Increase the concentration of NO2
11. Neither (i) nor (ii)