Phase change - liquid to gas

Evaporation

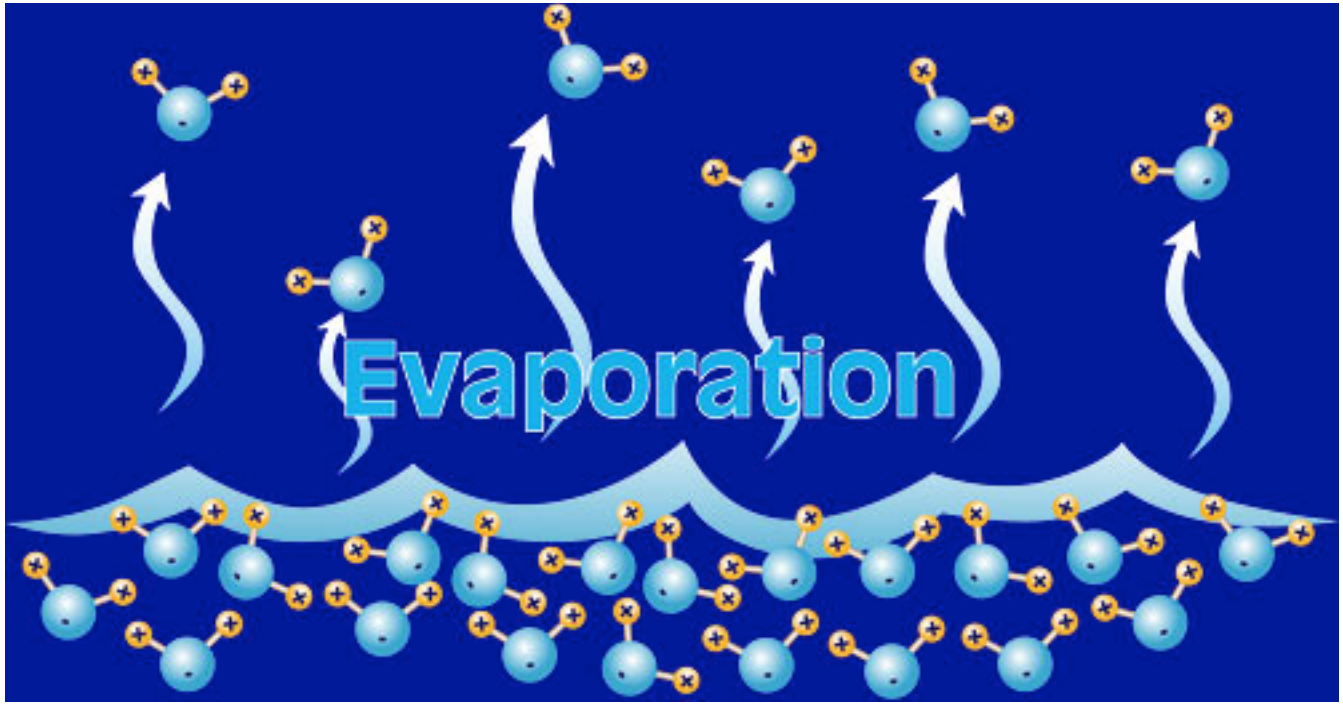
Vaporization

Boiling

Dynamic equilibrium

Evaporation - vaporization

- Some molecules have enough energy to escape into the gas phase



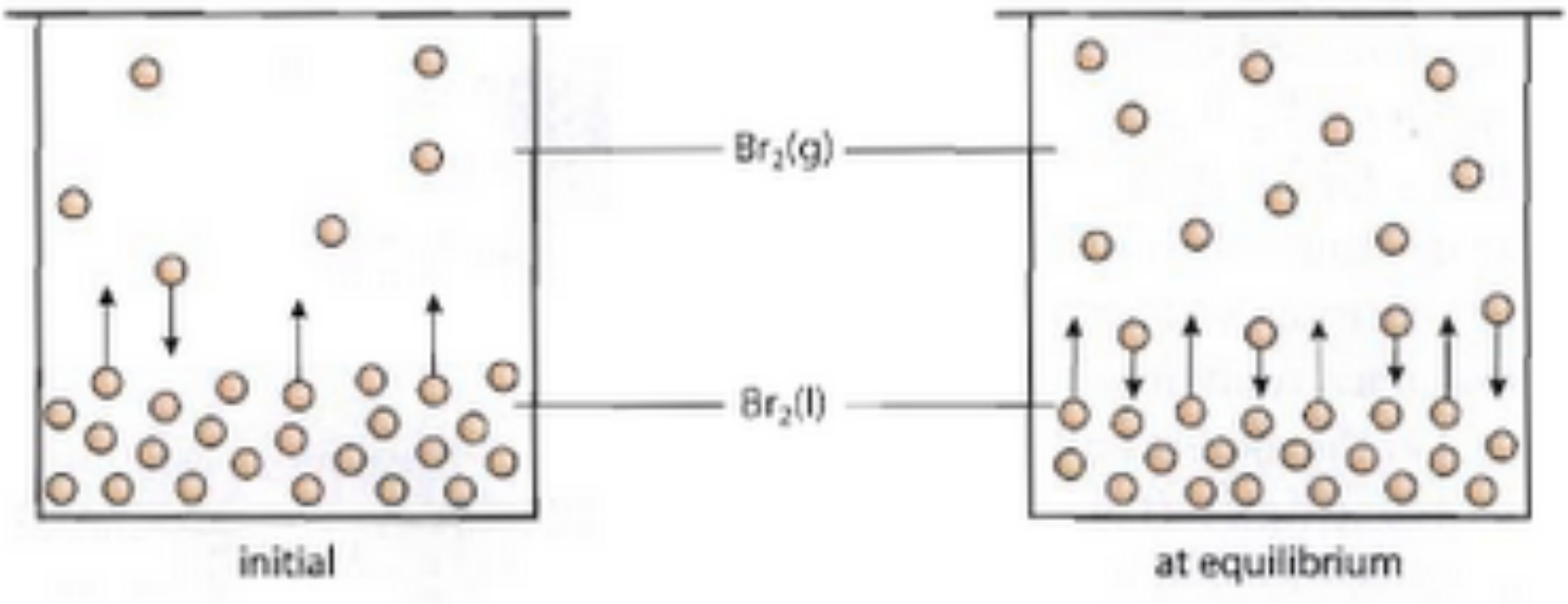
Evaporation - vaporization

- Liquid molecules must overcome the intermolecular attractions - this takes NRG and is a cooling process.
- explanation

Dynamic Equilibrium

- In a closed container evaporation happens.
- So does condensation…This produces dynamic equilibrium
- The rate of evaporation = rate of condensation
- vapor pressure

Dynamic equilibrium



Boiling point

- So what is boiling?
- When the atmospheric pressure is equal to the vapor pressure of the liquid boiling occurs
- boiling

Boiling

- Is it possible to boil water at 50 ^{o}C?
- Check out this demo

Dalton's Law of partial pressure

- Individual gases contribute to the total pressure of a system
- Pressure of a gaseous system only depends on the number of particles
- $P_{total} = P_1 + P_2 + P_3 \ldots.$

Sample problem

- Find the pressure of nitrogen in an automobile tire filled with air if the total pressure is 245.0 kPa

  - P_{O2} = 51.3 kPa
  - P_{CO2} = 0.10 kPa
  - P_{N2} =
  - P_{others} = 2.3 kPa