



Evaporation

In an evaporation process a liquid is converted into a gas or a vapor. During evaporation, some molecules in the liquid break away and enter the gas or vapor state. Evaporation is a cooling process. The cooling occurs because the molecules with the highest kinetic energy tend to escape the liquid first. The molecules left in the liquid have a lower average kinetic energy. Thus the liquid's temperature decreases.

Volatile liquids evaporate more rapidly than other liquids at the same temperature. Such liquids have relatively weak intermolecular forces. In general, the rate of evaporation depends on the strengths of the intermolecular forces and the rate at which heat is supplied to the liquid.

Forces of intermolecular attraction

The major factor that determines the rate of evaporation is the intermolecular forces of attraction between molecules. For instance: alcohols evaporate faster than water, because water molecules have stronger intermolecular forces of attraction than alcohols; one H_2O molecule can form up to four hydrogen bonds, whereas $\text{C}_n\text{H}_{2n+1}\text{OH}$ can only form two or three hydrogen bonds, because only one OH group is attached at the end of the carbon chain.

Moreover, the intermolecular forces of attraction also increase when the relative molecular mass increases. In this experiment, since only alcohols are tested, the number of carbons in the carbon chain will determine the relative molecular mass as well as the intermolecular forces of attraction. When the carbon chain is long, the molecule will have a larger surface area, resulting in greater forces between the carbon chains