Chapter 6 Student notes (adapted)

6.1 – Solutes and Solvents

Remember that a solution is;

-a solvent and solute (larger part, usually liquid is the solvent, solute is what is dissolved into it)

-not a suspension (solid bits in a liquid)

-a homogeneous mixture

A solute is only a solute when it can dissolve in a solvent. If one substance can not dissolve in a solvent, then we call it “insoluble’. Many things are soluble in some solvents, but they are insoluble in others (grease is an example). Water is “the universal solvent” because so many liquids, solids and gases dissolve in it. Not every substance dissolves in water.

Solutes can be solids (salt, sugar), liquids, and gases (oxygen, carbon dioxide, etc.). Fish can live in water because they breathe the oxygen that is dissolved in the water.

Examples of solutions:

-Vinegar is a solution of water and an acid.

-Soda pop is a solution of water, flavourings, colour, and carbon dioxide gas dissolved in water.

-Grease is insoluble in water, but not in petroleum-based liquids.

-Chlorophyll in rubbing alcohol.

Remember the particle theory of matter;

-All matter is made up of particles that are too small to be seen (atoms and molecules)

-The particles are always in motion (vibrating, moving in a straight line, spinning)

-The particles have empty space around them – a lot of empty space.

-The higher the temperature, the more motion the particles have (the more energy they have)

-Each type of pure substance has its own type of particle

Dissolving works because the particles of the solute fit into the spaces between the particles of the solvent. The particles are knocked off the solid solute by the actions of the moving particles of the solvent.

The more solute that is dissolved in a given volume of solvent increases the concentration of the solution. The terms ‘dilute’ (meaning not much solute in the solution) and ‘concentrated’ (lots of solute in the solution) are relative terms, or QUALITATIVE properties. The more solute per unit of solvent = higher concentration. With most solvents, the amount of a solute that will dissolve in it depends on the temperature of the solvent.