INTRODUCTION TO DIFFUSION

Atoms molecules and ions always move. The higher the temperature, the faster they move. In solid substances the molecules can't move very far, because they are held together by forces between them. However in liquids they move freely, bouncing into one another and are even freer in a gas. When they move freely they spread themselves out as evenly as they can. This happens with gases, solutions and mixtures of liquids.

Diffusion is the movement of particles from an area where they are in high concentration, to an area where they are in a low concentration. Example: You spray a perfume or body splash in one corner of a room. The corner in which you spray the perfume will be the area of high concentration. Before long the perfume will be smelled throughout the room (the area of low concentration), because the particles of the perfume have spread out or diffused through the air. Therefore, diffusion evens out molecules and results from random movement.

FACTORS THAT INFLUENCE THE RATE OF DIFFUSION

TEMPERATURE The higher the temperature the faster the rate of diffusion. Hence, the lower the temperature the slower the rate of diffusion.

SIZE The smaller the molecule, the faster the rate of diffusion. Therefore the larger the molecule, the slower the rate of diffusion.

Thin layers and large surface areas favour rapid diffusion, while thick layers and small surface area favour slow diffusion.

For diffusion to occur there must be a concentration gradient (there must be a concentration of a substance in one area must be higher than it is in another area). The greater the concentration gradient/difference, the faster the rate of diffusion.

DIFFUSION IN LIVING THINGS

Diffusion is important to living organisms because they obtain their requirements and get rid of their waste products by diffusion. Example: Oxygen diffuses into a human cell because it is continuously being used up inside the cell. This creates a gradient into the cell as there is always more oxygen outside than inside. At the same time Carbon dioxide (c02) diffuses the opposite way. The concentration of C02 is always higher on the inside of the cell than on the outside because the cell produces CO2 all the time. In plants CO2 diffuses from the air, into the stomata. This is because there is a lower concentration of carbon dioxide inside the leaf, because cells are using it up. Outside the leaf in the air, the concentration is higher. Therefore carbon dioxide diffuses in the leaf along its