

WHMIS Symbols



Flammable



Compressed Gas



Biohazardous



Corrosive



Oxidizing



Highly Reactive



Toxic



Poisonous

Safety guidelines and procedures are in place in the school science lab to help make it safe for students when doing inquiry experiments.



Danger



Warning



Caution

FLUID USES

A fluid is anything that has no fixed shape and can flow.

Fluid properties help us to use them in association with other substances.

Fluids can move solids, by mixing with solids to make SLURRIES.

Solids are often made from fluids, because they are easier to move and form into specific shapes.

Fluids can hold other materials making it easier to use these materials.

CLASSIFICATION of MATTER

All matter is classified into two forms: pure substances or mixtures.

PURE SUBSTANCES are those types of matter made up of the same particles with unique characteristics or properties. Pure substances can be either elements or compounds.

MIXTURES are two or more substances that are combined. Mixtures can be heterogeneous, or homogeneous

Variations of these mixtures are mechanical (you can see the different parts), solution (the substance appears to be one substance), suspension (a cloudy mixture in which tiny parts of one substance are held in another) and colloid (similar to the suspension, but the parts cannot be easily separated out).

PAPER CHROMATOGRAPHY

To determine what fluids are pure substances and which are mixtures a scientific technique is used.

Paper chromatography is a test that determines if a fluid is pure or not.

A piece of filter paper is placed just touching the top part of a test substance.

If the test substance is pure (made up of only one type of matter) then the fluid will be absorbed by the filter paper moving up only one level. If the test substance is a solution, each part of the substance will move up to different levels.

The filter paper showing evidence of the test substance is called a chromatogram.

SOLUTES & SOLVENTS

A SOLUTE is a substance that dissolves in a fluid. The fluid that does the dissolving is called the SOLVENT. Water is called the UNIVERSAL SOLVENT and a solution that uses water as the solvent is called AQUEOUS.

CONCENTRATION

The amount of solute that dissolves in a solvent is called CONCENTRATION. The more solute dissolved, the higher the concentration. To compare solution concentrations you need to know the amount of solute in the same volume of solvent for each solution.

A CONCENTRATED solution has a large amount of solute in a solvent compared to a DILUTED solution which has a smaller amount of solute in the same volume of solution.

SOLUBILITY

The maximum amount of solute that can be dissolved in a given volume of solvent at a certain temperature is called SOLUBILITY.

A solution that will allow you to continue to dissolve solute is called an UNSATURATED solution. A solution that will not allow you to dissolve any more solute is called a SATURATED solution. Every solution has a SATURATION POINT, where no more solute can be dissolved at a given temperature. If the temperature of a solvent changes, the saturation point can also change.

Solutions are not always solids dissolved in liquids. Solutions can also be gas and gas, gas and liquid, liquid and liquid, solid and solid.

The PARTICLE MODEL

To describe the structure of all matter, scientists developed a theory and a model. The ATOMIC THEORY is represented by the PARTICLE MODEL and has four distinct parts:

All matter is made up of tiny particles, with each substance having its own unique particles.

All the particles of a substance are always moving and vibrating.

All particles in matter can be either attracted to each other, or bonded together.

All particles in matter have spaces between them, no matter what state they are in.

VISCOSITY

The rate at which a fluid flows is called VISCOSITY. This property is often referred to as 'thickness'. It is determined by a fluid's internal resistance or friction that keeps it from flowing.

The greater the resistance to flow the higher the viscosity or thickness of a substance. High viscosity fluids are thick and flow very slowly, while low viscosity fluids are thin and flow easily. Temperature can affect viscosity, by slowing or speeding up the particles, increasing or decreasing resistance between the particles.

To measure viscosity of different substances, the RAMP METHOD is used. Pour the substances down a ramp at the same time and time the different flow rates to compare viscosities.

DENSITY

The amount of matter in a given volume is a property called DENSITY.

Each type of matter has its own density, making it a distinguishing property of matter.

To calculate the density of a particular type of matter you divide the mass of the sample by its volume.

$$d = M / V$$

Density can be changed by temperature. One substance can have different densities depending on its temperature.

A device used to measure density of a liquid directly is called a hydrometer.