1.1 Pure Substances

- Single **element** or **compound** (nothing added, eg pure milk)
- Specific **melting** and **boiling** temperatures and can be used to distinguish pure substances from mixtures

1.2 Formulations

- **Mixture** designed as a **useful** product with a particular purpose
- Made by **mixing components** in carefully measured quantities to achieve required **properties**
- **Examples**: Fuels, cleaning agents, paints, medicines, alloys, fertilisers and foods

1.4 Identification of common gases

Gas being tested	Test carried out
Hydrogen (H_2)	Burning splint placed in a test tube filled with the gas. Burns rapidly with a pop sound.
Oxygen (O_2)	Glowing splint placed into a test tube of the gas. Splint will relight.
Carbon dioxide (CO_2)	Aqueous solution of calcium hydroxide (lime water). When CO_2 is shaken or bubbled through, solution will turn milky (cloudy).
Chlorine (Cl_2)	Using litmus paper. Damp litmus paper put into Cl_2 gas, paper is bleached and turns white.

1.3 Chromatography

A technique used to separate mixtures and help identify substances.
Chromatography involves a **stationary phase** and a **mobile phase**. Substances separate depending on their distribution between the stationary and mobile phases.
Different compounds have different **Rf values** in different **solvents**. Rf values can be used to identify the compounds in a mixture.

$$\textbf{Rf value} = \frac{\text{distance moved by substance}}{\text{distance moved by solvent}}$$

A mixture will give 2 or more spots on a **chromatogram** but a pure compound will give one spot on a **chromatogram**.