| 1 – Purity and Formulations | |
|---|---|
| **Element** | A substance made up of only **one type** of **atom**. (Atoms with the **same** number of **protons**). |
| **Compound** | A substance made up of **atoms** of at least **two different elements**, **chemically joined** together. |
| **Mixture** | A substance made from **two or more** elements or compounds that **aren't chemically bonded** to each other. |
| **Pure** | A substance that only contains **one element** or **compound** throughout. E.g. pure water only contains water molecules. |
| **Identifying pure substances** | A chemically **pure** substance will melt or boil at a **specific temperature**. You can test purity by **measuring** a substances' **melting** or **boiling** point. The **closer** the measured value to the actual melting or boiling point, the **purer** the sample is. |
| **Melting points of impure substances** | **Impurities** in a sample will **lower** the **melting** point and **increase** the melting **range** of the substance. Impurities will **increase boiling** point. |
| **Formulations** | A **useful mixture** with a **precise purpose** made by following a **formula**. E.g. fuels, cleaning products, paints and medicines. |

| 2 – Paper chromatography (required practical) | |
|---|---|
| **Chromatography** | An analytical method used to **separate** a **mixture** of **coloured liquids**. E.g. inks, paints and food colouring. |
| **Method** | 1. Take a piece of **filter paper** and draw on a **start line** near the bottom using **pencil**.<br>2. Add **small** dots of **samples** to the start line. Make sure they are **spaced** well apart.<br>3. **Secure** the filter paper in a beaker with a small amount of **solvent** in (solvent must be **below** start line).<br>4. Wait for **coloured liquids** to rise up the paper, stop before they reach the top. Take it out and **leave** to **dry**. |
| **Pencil start line** | The start line must be drawn in **pencil** as it is **insoluble**. Pen would **travel** up the paper with the samples. |
| **Mobile phase** | The phase in which molecules can **move**. This is the **solvent** that moves through the paper (carrying the different substances). |
| **Stationary phase** | The phase where moelcules **cannot move**. This is the **paper**. |
| **$R_f$ value** | The **ratio** between the **distance travelled** by a **dissolved substance** and the distance travelled by a **solvent**. |
| **$R_f$ value calculations** | $$R_f = \frac{disance\ travelled\ by\ substance}{distance\ travelled\ by\ solvent}$$<br>E.g. The solvent moved 110mm from the start line, and the pigment moved 50mm.<br>$R_f = \frac{50}{110}$ $R_f = 0.45$ |

| 3 – Identification of common gases | |
|---|---|
| **Chlorine** | Chlorine **bleaches damp litmus paper,** turning it white. (It may turn red first because chlorine solution is acidic.) |
| **Oxygen** | Put a **glowing splint** inside a test tube containing oxygen. The oxygen will **relight** the glowing splint. |
| **Carbon dioxide** | **Bubble** carbon dioxide through **limewater** (a solution of **calcium hydroxide**) and the solution will turn **cloudy**. |
| **Hydrogen** | Hold a **lit splint** at the end of a test tube containing hydrogen. There will be a '**squeaky pop**'. |

# GCSE Science

## Chemistry C8 – Chemical Analysis