

	19 K Potassium 39.0983	79 Au Gold 196.96657	11 Na Sodium 22.98976928	39 Y Yttrium 88.90585	85 At Astatine [210]	53 I Iodine 126.90447	
6 C Carbon 12.01115	2 He Helium 4.002602	25 Mn Manganese 54.938045	53 I Iodine 126.90447	16 S Sulfur 32.065	69 Tl Thallium 204.38427	86 Rn Radon [222]	39 Y Yttrium 88.90585

2 Experimental techniques

2.1 Measurement

Core

- Name appropriate apparatus for the measurement of time, temperature, mass and volume, including burettes, pipettes and measuring cylinders

2.2 Purity

2.2.1 Criteria of purity

Core

- Demonstrate knowledge and understanding of paper chromatography
- Interpret simple chromatograms
- Identify substances and assess their purity from melting point and boiling point information
- Understand the importance of purity in substances in everyday life, e.g. foodstuffs and drugs

Supplement

- Interpret simple chromatograms, including the use of R_f values
- Outline how chromatography techniques can be applied to colourless substances by exposing chromatograms to substances called locating agents. (Knowledge of *specific* locating agents is **not** required.)

2.2.2 Methods of purification

Core

- Describe and explain methods of purification by the use of a suitable solvent, filtration, crystallisation and distillation (including use of a fractionating column). (Refer to the fractional distillation of petroleum in section 14.2 and products of fermentation in section 14.6.)
- Suggest suitable purification techniques, given information about the substances involved

	19 K Potassium 39.0983	79 A Gold 196.96654	11 Na Sodium 22.98976928	39 Y Yttrium 88.90584	85 At Astatine (210)	53 I Iodine 126.90447	
6 C Carbon 12.0107	2 He Helium 4.002602	25 Mn Manganese 54.938045	53 I Iodine 126.90447	16 S Sulfur 32.06	69 Tl Thallium 204.384	86 Rn Radon (222)	39 Y Yttrium 88.90584

2 Experimental Techniques

2.1 Measurement

Name appropriate apparatus for the measurement of time temperature mass and volume .

including burettes pipettes and measuring cylinders.

- Appropriate apparatus for measuring. of

Time: stopwatch/clock

Temperature: thermometer

Mass: balance

Volume: measuring cylinder, burette, pipette



Temperature

- Temperature is measured with a thermometer which can normally give readings to the nearest degree Celsius
- Digital thermometers are more precise than regular thermometers
- The units of temperature are degrees Celsius ($^{\circ}\text{C}$)

Time

- Time can be measured using a stopwatch

accurate to one or two decimal places

- The units of time are seconds or minutes



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6 C Carbon 12.01115	2 He Helium 4.002602	25 Mn Manganese 54.938045	53 I Iodine 126.90447	16 S Sulfur 32.06	69 Tl Thallium 204.3833	86 Rn Radon [222]	39 Y Yttrium 88.90584

Mass

- Mass is measured using a digital balance with readings to two decimal places.
- Units of mass commonly used are kilograms (kg) and grams (g)



Volume-liquids

The volume of a liquid can be determined using several types of apparatus according to the accuracy required.



- For approximate volumes where accuracy is not an important factor, measuring cylinders are used. They are graduated (have a scale so can be used to measure) and are available in 25 cm³, 50 cm³, 100 cm³ and 250 cm³

- Pipettes are the most accurate way of measuring a fixed volume of liquid, usually 10 cm³ or 25 cm³



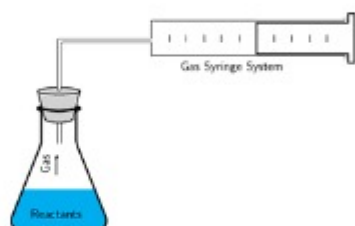
19 K Potassium 39.0983	79 Au Gold 196.96657	11 Na Sodium 22.98976928	39 Y Yttrium 88.90584	85 At Astatine [210]	53 I Iodine 126.90447		
6 C Carbon 12.01115	2 He Helium 4.002602	25 Mn Manganese 54.938045	53 I Iodine 126.90447	16 S Sulfur 32.065	69 Tl Thallium 204.3842	86 Rn Radon [222]	39 Y Yttrium 88.90584

- Burettes are the most accurate way of measuring a variable
- volume of liquid between 0 cm³ and 50 cm³ (e.g. in a titration)

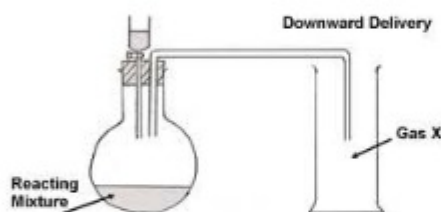


Volume-gases

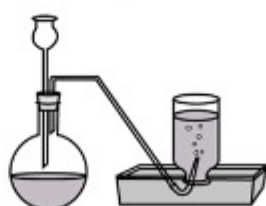
- The volume of a gas measurement is done through
- A gas syringe
- A graduated cylinder inverted in water but the gas should not be water-soluble
- If the gas happens to be heavier than air and is colored, the cylinder can be used upright



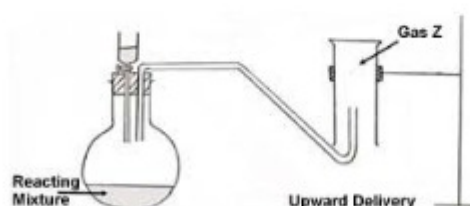
Gas Syringe collection



Downward delivery collection



Over water collection



Upward delivery collection