

BA SANGAM COLLEGE

YEAR 12

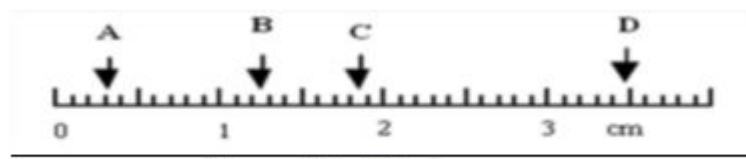
CHEMISTRY

WORKSHEET 5

STRAND 1

GENERAL CHEMISTRY

1. Consider the figure on a measuring instrument given below.



Source: <http://study.com>

Using this figure, the measured value and uncertainties for the reading at C would be

- | | |
|----------------------------|-----------------------------|
| A. 1.9cm | C. $1.85 \pm 0.01\text{cm}$ |
| B. $1.85 \pm 0.1\text{cm}$ | D. 1.85cm |

2. A sample of liquid has a measured volume of 36.54 mL. Assume that the measurement was recorded properly. Assume the volume measurement was made with a graduated measuring cylinder. How far apart were the scale divisions on the measuring cylinder, in mL?

- | | |
|-----------|------------|
| A. 10 mL | C. 1 mL |
| B. 0.1 mL | D. 0.01 mL |

3. In the laboratory, a student uses a top pan balance to find the mass of a small object. She tells you correctly that the digital readout shows 44.15 g. Write the measurement with its uncertainty.

4. If 38.5 g of sodium chloride is contained in 1 L solution of sodium chloride, how many grams of sodium chloride is contained in 4.55 L of this solution?

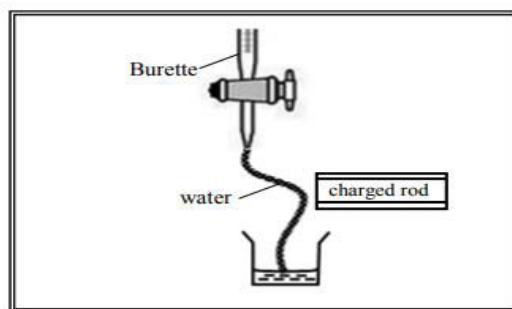
STRAND 2

INVESTIGATING MATTER

1. Graphite is a very good example of a covalent substance. A property of graphite is that it

- A. can conduct electricity.
- B. is highly soluble in water.
- C. has very low melting point.
- D. is very hard and difficult to break

2. A group of Year 12 students carried out an experiment to determine the polarity of water molecule. A charged rod was brought closer to the stream of water running down from a burette. The observation is given in the diagram below.



Source: www.schoolphysics.co.uk

Why did the stream of water bend or deflect when the charged rod was brought closer?

3. Copper metal is a good conductor of electricity and is used to make electrical wires. In terms of its **atomic bonding**, explain why copper

- is a good conductor of electricity.
- can be pulled into thin and long wires.

4. Account for the following properties:

- Solid iodine can sublime at relatively low temperature.
- Diamond is hard whereas graphite is soft and slippery.
- Graphite can conduct electricity but diamond cannot.
- Metals can conduct electricity in solid state

STRAND 3

REACTIONS

1. To prepare a standard solution of sodium carbonate (Na_2CO_3), a student dissolved 2.65 g of the anhydrous salt in distilled water. The solution was then transferred to a standard flask and the total volume was adjusted to the 500 mL mark.

Note: $M(\text{Na}_2\text{CO}_3) = 106 \text{ g mol}^{-1}$

- Calculate the concentration of the sodium carbonate solution prepared in **mol L⁻¹**.

20 mL samples of the sodium carbonate solution prepared were then titrated against a solution of hydrochloric acid (HCl). It was found that an average of 18.50 mL of the acid was required to react completely with 20 mL of the sodium carbonate solution.

The balanced equation for the reaction is:



- How many moles of sodium carbonate was present in the 20 mL sample?
- Find the number of moles of HCl that reacted with the sodium carbonate solution.
- Calculate the concentration of the hydrochloric acid solution in **mol L⁻¹**.

2. A substance that is most often used as an oxidising agent in chemical processes is

- | | |
|------------|--------------|
| A. iron. | C. zinc. |
| C. carbon. | D. chlorine. |