Quiz (Preparation of Standard Solution)

1. Name the apparatus that is suitable for each of the following purposes:
   (a) To deliver 25.0 cm³ of a liquid accurately.

   (b) To measure about 22.0 cm³ of a liquid.

   (c) To weigh out an object to an accuracy of 0.001 g.

   (d) To make up 100 cm³ of a solution to 250.0 cm³.

2. 3.20 g of anhydrous sodium carbonate is dissolved in distilled water and the solution was made up to a 250.0 cm³. What is the molarity of the solution prepared?
   (Relative atomic masses: C = 12.0, O = 16.0, Na = 23.0)

Suggested Answer

1. (a) 25.0 cm^3 pipette

    (b) 25.0 cm^3 measuring cylinder

    (c) Electronic balance

    (d) 250.0 cm^3 volumetric flask

2. Molar mass of Na_2CO_3
    = 23.0 × 2 + 12.0 + 16.0 × 3
    = 106.0 g mol^{-1}

    Number of moles of Na_2CO_3 used
    = 3.20 / 106.0
    = 0.0302 mol

    Molarity of the Na_2CO_3 solution prepared
    = number of moles of Na_2CO_3

    Volume of solution
    = 0.0302 / 0.25
    = 0.121 mol dm^{-3}