

**QUESTION 3**

3. 1.Learners made a mini volcano in science laboratory by adding sodium bicarbonate to ethanoic acid. They added 100 ml of a 0, 2 mol.dm<sup>-3</sup> ethanoic acid solution to 10 g of NaHCO<sub>3</sub> to start the reaction of the volcano.

The balanced equation for this reaction is:



- 3.1.1 Define the term limiting reagent. (2)
- 3.1.2 Determine the limiting reagent in this reaction. (6)
- 3.1.3 Calculate the mass of the other substance in excess. (3)
- 3.1.4 Calculate the volume of CO<sub>2</sub> produced at STP. (4)

3.2 A solution of potassium hydroxide (KOH) is prepared by dissolving 3,36 g crystals of KOH in 250 cm<sup>3</sup> of water.

Calculate the concentration of the potassium hydroxide solution. (4)

3.3 25 cm<sup>3</sup> of a potassium hydroxide solution of concentration 0,25 mol.dm<sup>-3</sup> completely neutralises a dilute solution of sulphuric acid (H<sub>2</sub>SO<sub>4</sub>) in a flask.

The unbalanced equation below represents the reaction that takes place:



- 3.3.1 Balance the above equation. (2)
- 3.3.2 Calculate the mass of sulphuric acid in the flask. (5)

**[25]**

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profil baja profil ht 400 mm bf 200 mm tw 8 mm tf 13 mm r 16 mm  $A$  8410 mm<sup>2</sup>  $I_x$  237000000 mm<sup>4</sup>  $I_y$  17400000 mm<sup>4</sup>  $r_x$  168  
mm  $r_y$  45 4 mm  $S_x$  1190000 mm<sup>3</sup>  $S_y$  174000 mm<sup>3</sup> c

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