

Credit will be given for the correct use of significant figures in answers to part (ii). (1 mark)

(ii) Biodiesel contains small amounts of free monoprotic acids. The total concentration of acid in a sample of biodiesel was measured by titration with potassium hydroxide (KOH) solution.

(1) A KOH solution was prepared and shown to have a concentration of  $0.01017 \text{ mol L}^{-1}$ . Calculate the mass of KOH in 250.0 mL of this solution.

(3 marks)

(2) A volume of 1.000 L of biodiesel solution was prepared by diluting 20.00 mL of biodiesel.

20.00 mL samples of the biodiesel solution were titrated with the  $0.01017 \text{ mol L}^{-1}$  KOH solution.

(A) Name the apparatus that would have been used to accurately transfer the samples of biodiesel solution to the titration flasks.

\_\_\_\_\_ (1 mark)

(B) It was found that an average of 4.2 mL of KOH solution was required in the titration.

Calculate the total concentration of monoprotic acids in the original biodiesel.

(4 marks)

TOTAL: 15 marks