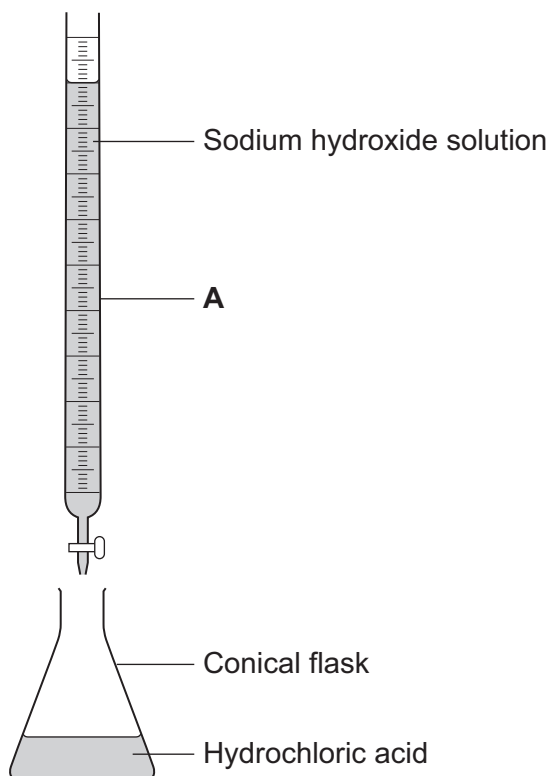


- 3 A student used the apparatus in **Figure 2** to do a titration.

**Figure 2**



- 3 (a) (i) What is the name of the piece of apparatus labelled **A**?

Draw a ring around the correct answer.

[1 mark]

**burette**

**measuring cylinder**

**test tube**

- 3 (a) (ii) What should the student add to the acid in the conical flask?

Draw a ring around the correct answer.

[1 mark]

**catalyst**

**indicator**

**water**

- 3 (a) (iii) What would the student see when the end point of the titration has been reached?

[1 mark]

.....



**3 (b)** The student does the titration three times.

**3 (b) (i)** State **one** variable that the student needs to keep the same to make it a fair test.

[1 mark]

.....

**3 (b) (ii)** The student's results are shown in **Table 1**.

**Table 1**

Titration	Volume of sodium hydroxide solution added in cm <sup>3</sup>
1	22.40
2	22.20
3	22.30

Calculate the mean volume of sodium hydroxide solution added.

[1 mark]

..... cm<sup>3</sup>

5

**Turn over for the next question**

**Turn over ►**



Question	Answers	Extra information	Mark	AO / Spec. Ref.	ID
3(a)(i)	burette		1	1 / 3.4.1g	A
3(a)(ii)	indicator		1	1 / 3.4.1g	A
3(a)(iii)	colour change		1	1 / 3.4.1g	E
3(b)(i)	any <b>one</b> from: <ul style="list-style-type: none"> <li>• volume of (hydrochloric) acid</li> <li>• concentration of (hydrochloric) acid</li> <li>• concentration of (sodium) hydroxide</li> </ul>	<p><i>allow amount of (hydrochloric) acid</i></p> <p>allow concentration of alkali</p>	1	3 / 3.4.1g	E
3(b)(ii)	22.3(0)		1	2 / 3.4.1g	G
<b>Total</b>			<b>5</b>		