

5 Penicillin is an antibiotic.

(a) (i) State the type of organism that antibiotics are used to kill.

..... [1]

(ii) It is important to try and limit the development of antibiotic resistance.

Describe ways of limiting the development of antibiotic resistance.

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..... [2]

(b) Penicillin is produced by an organism called *Penicillium chrysogenum*.

Fig. 5.1 is a diagram of *Penicillium chrysogenum*.

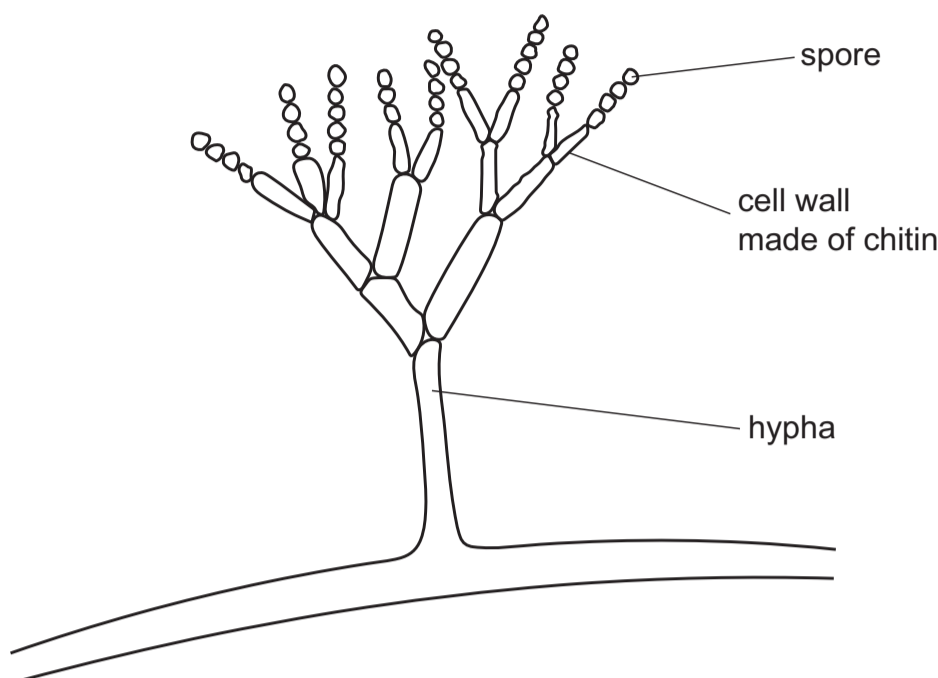


Fig. 5.1

(i) State what *Penicillium* in the scientific name of *Penicillium chrysogenum* represents in the binomial system.

..... [1]

(ii) Using the information in Fig. 5.1, identify the kingdom that contains *Penicillium chrysogenum*.

..... [1]

(c) Penicillin can be made in a fermenter.

(i) State the name of **one other** product made in a fermenter.

..... [1]

Fig. 5.2 shows a fermenter.

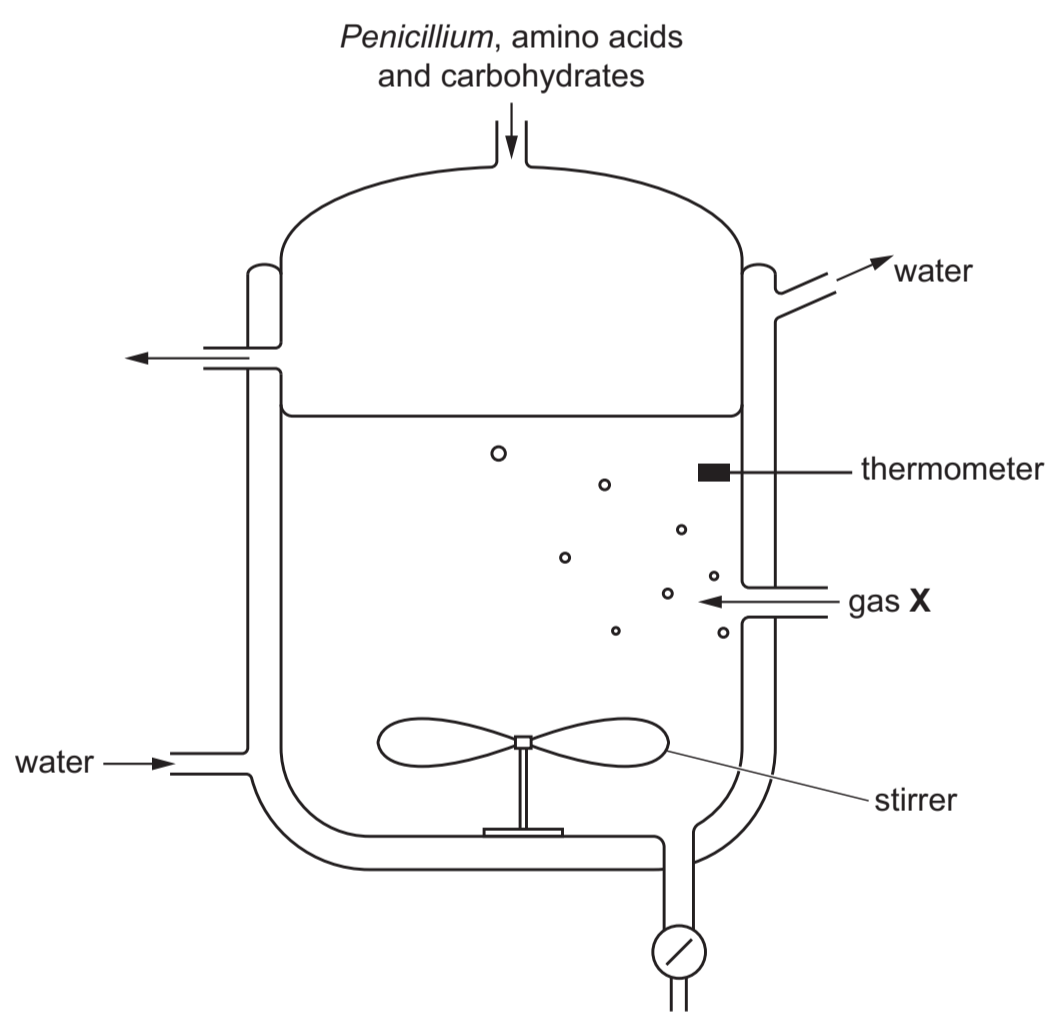


Fig. 5.2

(ii) Gas X in Fig. 5.2 is needed for the production of penicillin.

State the name of gas X.

..... [1]

(iii) The concentration of gas X is one of the conditions that must be controlled to ensure that penicillin is produced.

State the **other** conditions required to produce penicillin **and** describe how they are controlled in the fermenter.

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..... [5]

(d) State the name of the organism that is used in bread-making **and** in biofuel production.

..... [1]