

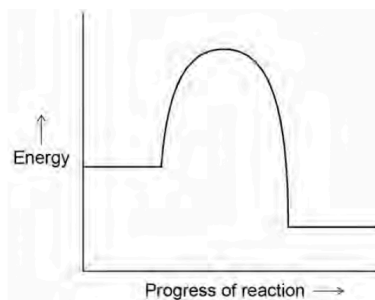
Collision theory and activation energy

Q1. (2019)

A)

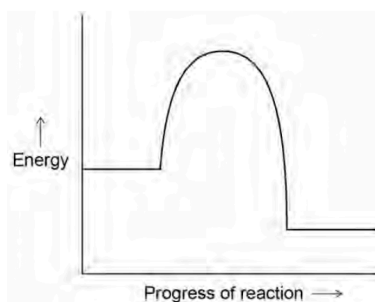
Copper is used as a catalyst.

0 5 . 4 **Figure 7** shows the reaction profile for a reaction without a catalyst.

Figure 7Draw an arrow on **Figure 7** to show the activation energy.**[1 mark]**

B)

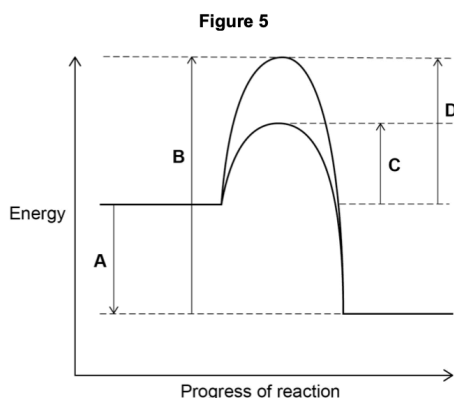
0 5 . 5 The reaction profile for the reaction without a catalyst is shown again in **Figure 8**.

Figure 8Draw a reaction profile on **Figure 8** for the same reaction with a catalyst.**[2 marks]**

Q2. (2022)

The industrial process to produce ammonia uses a catalyst.

0 3 . 6 Figure 5 shows the reaction profile for the reaction with and without a catalyst.



Which letter represents the activation energy for the reaction with a catalyst?

[1 mark]

Tick (✓) **one** box.

A	☐	B	☐	C	☐	D	☐
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Q3. (2022)

0 3 . 7 Give **one** reason why using a catalyst reduces costs.

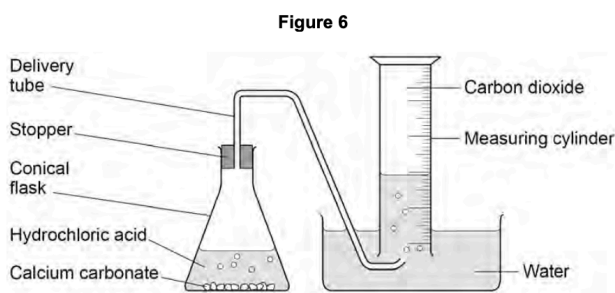
Do **not** answer in terms of activation energy.

[1 mark]

Q4. (2024)

A student investigated the effect of changing the particle size of calcium carbonate on the rate of reaction with hydrochloric acid.

Figure 6 shows the apparatus.



0 7 . 2 The student investigated the effect of increasing the temperature on the rate of a reaction.

Explain the effect of increasing the temperature on the rate of a reaction.

Refer to particles and collisions in your answer.

[3 marks]