AQA - Reversible reactions and dynamic equilibrium – GCSE Combine Science Chemistry

1. May/2020/Paper_8464/2H/No.7

This question is about equilibrium.

Describe how a reaction reaches equilibrium.

[2 marks]

Nitrogen dioxide gas reacts to form dinitrogen tetraoxide gas.

The reaction is reversible.

The equation for the reaction is:

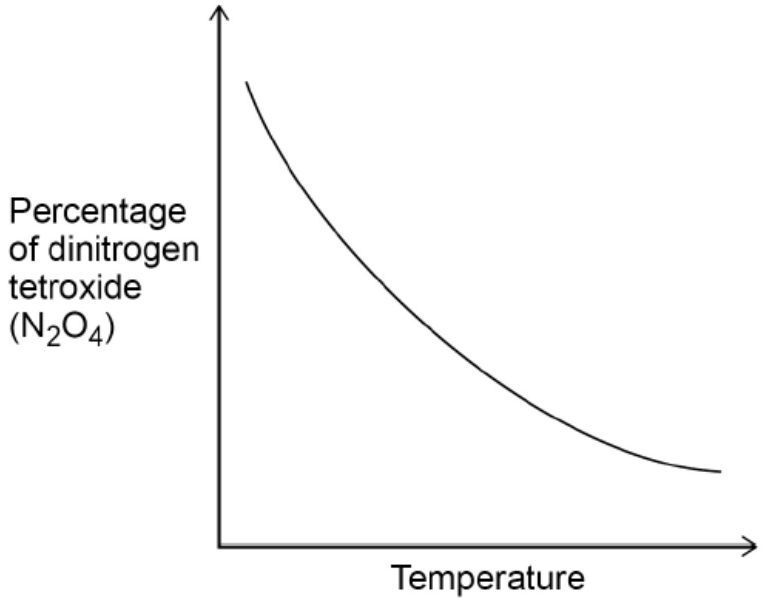
$$2\ NO_2(g) \rightleftharpoons N_2O_4(g)$$

Explain the effect on the equilibrium position of increasing the pressure.

[2 marks]

Figure 7 shows the change in the percentage of dinitrogen tetroxide (N_2O_4) in the equilibrium mixture as the temperature of the equilibrium mixture is changed.

Figure 7



Explain the effect on the equilibrium position of increasing the temperature.

Use **Figure 7**.

[3 marks]

2. Jun/2019/Paper_8464/2F/No.1.4-1.6

Oxygen reacts with sulfur dioxide.

The reaction is reversible.

What is the symbol for a reversible reaction?

[1 mark]

_____

Complete the sentence.

[1 mark]

In a reversible reaction the forward reaction is exothermic, so the

reverse reaction is _____ .

A reversible reaction happens in apparatus which stops the escape of reactants and products.

Complete the sentence.

[1 mark]

Equilibrium is reached when the forward and reverse reactions happen at

exactly the same _____ .

3. Jun/2019/Paper_8464/2F/No.5.3

Copper sulfate is produced during the extraction of copper from the Earth's crust.

Copper is produced from copper sulfate solution using iron.

The word equation for the reaction is:

copper sulfate + iron → iron sulfate + copper

From the equation a company calculated that 648 kg of copper sulfate are needed to produce 617 kg of iron sulfate and 258 kg of copper.

Calculate the mass of iron needed to make 258 kg of copper.

[2 marks]

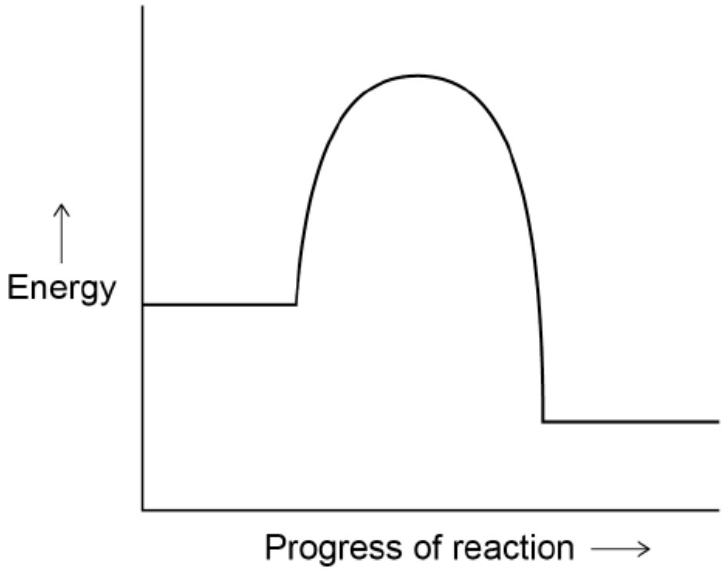
Mass = _____ kg

4. Jun/2019/Paper_8464/2F/No.5.4

Copper is used as a catalyst.

Figure 7 shows the reaction profile for a reaction without a catalyst.

Figure 7



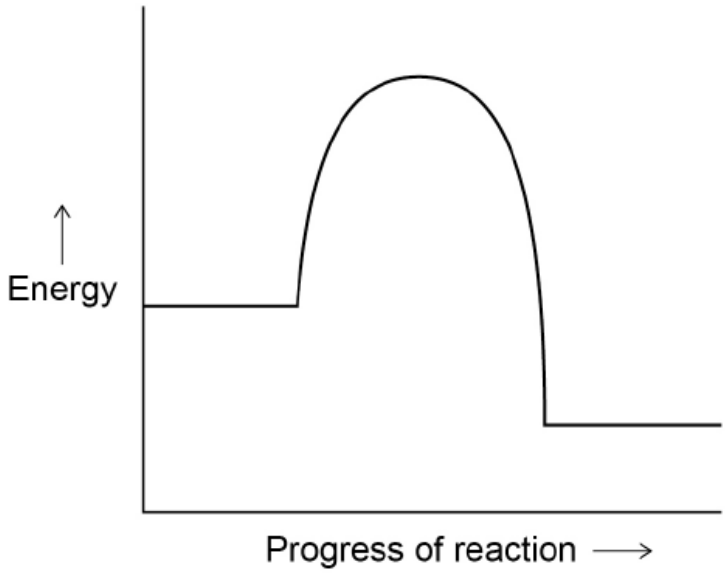
Draw an arrow on **Figure 7** to show the activation energy.

[1 mark]

5. Jun/2019/Paper_8464/2F/No.5.5

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

Figure 8



Draw a reaction profile on **Figure 8** for the same reaction with a catalyst.

[2 marks]

6. Jun/2019/Paper_8464/2H/No.6.2

The reaction between oxygen and sulfur dioxide is at equilibrium.

$$O_2(g) + 2SO_2(g) \rightleftharpoons 2SO_3(g)$$

Some of the sulfur trioxide (SO_3) is removed.

Explain what happens to the position of the equilibrium.

[2 marks]