

**AQA, OCR, Edexcel**

**GCSE Science**

# **GCSE Chemistry**

Equilibrium

Answers

**M M E**

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Total Marks: /24

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### ***Reversible reactions and dynamic equilibrium***

#### ***Reversible reactions***

Q1: What is a reversible reaction?

A= A reaction whereby the products of the reaction can react to produce the original reactants.

(1 marks)

Q2: How can the direction of a reversible reaction be changed?

A= By changing the conditions.

(1 mark)

#### ***Energy changes and reversible reactions***

Q3: Complete the sentences in regard to distribution of energy in reversible reactions.

If a reversible reaction is **exothermic/endothermic (1 mark)** in one direction, it is **exothermic/endothermic (1 mark)** in the other. The **same (1 mark)** amount of energy is transferred in each case.

(3 marks)

#### ***Equilibrium***

Q4: If a reversible reaction occurs in apparatus which prevents the escape of reactants and products, when would equilibrium be reached?

A= When the forward and backward reactions (1 mark) occur at exactly the same rate (1 mark).

(2 marks)

#### ***The effect of changing conditions on equilibrium***

Q5: If a system is at equilibrium and a change is made to any of the conditions, what happens?

A= the system responds to counteract the change/ alters the position of equilibrium

(1 mark)

Q6: Is the following statement true or false?

Even if the concentration of one of the reactants or products is changed, the system remains at equilibrium.

False

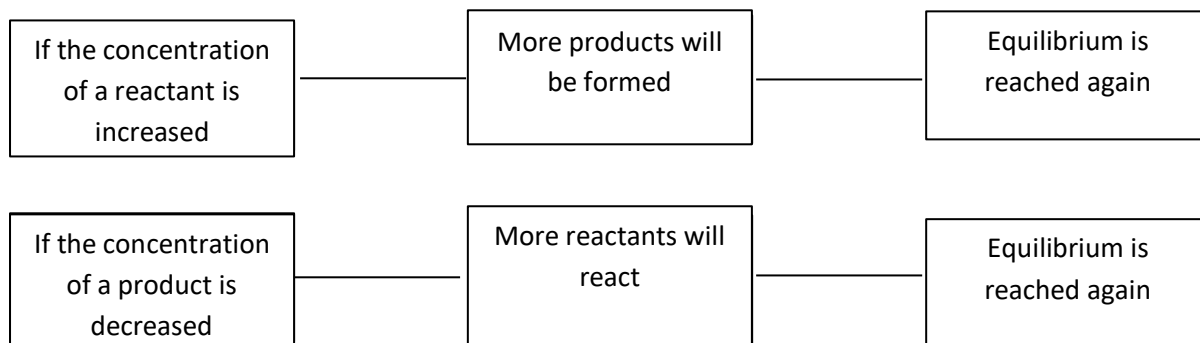
(1 mark)

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Explain your answer.

A= the system is no longer at equilibrium. The concentrations of all the substances will change until equilibrium is reached again (1 mark)

Q7: Using the boxes provided complete the diagram.



(4 marks)

### ***The effect of temperature changes on equilibrium***

Q8: Complete the tables using the information in the boxes.

<b>If the temperature of a system at equilibrium is increased:</b>	<b>If the temperature of a system at equilibrium is decreased:</b>
The relative amount of products at equilibrium increases for an endothermic reaction.	The relative amount of products at equilibrium decreases for an endothermic reaction.
The relative amount of products at equilibrium decreases for an exothermic reaction.	The relative amount of products at equilibrium increases for an exothermic reaction.

(4 marks)

### ***The effect of pressure changes on equilibrium***

Q9: For gaseous reactions at equilibrium, complete the following sentences.

An **increase (1 mark)** in pressure causes the equilibrium position to shift towards the side with the **smaller (1 mark)** number of molecules.

A **decrease (1 mark)** in pressure causes the equilibrium position to shift towards the side with **larger (1 mark) number** of molecules.

(2 marks)

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### ***Le Chatelier's Principle***

Q10: What is Le Chatelier's Principle and why is it important?

3 of the 4 points required

A= When a system is in equilibrium for a long period of time and is subjected to a change in temperature, concentration, volume or pressure (1 mark) the system readjusts to counteract the effect (1 mark). It is important because it can be used to predict the effects of changing a system at equilibrium. (1 mark). Can be used in industry to improve profits (1 mark)

(3 marks)