Reversible Reactions Worksheet

Combined Science - Chemistry - Key Stage 4

The Rate and Extent of Chemical Change

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Multiple choice quiz

In an endothermic reaction, energy is...

A

Given out to the surroundings

B

Taken in from the surroundings

C

The same

D

Measured in °C

What happens to the temperature of the surrounding during an exothermic reaction?

A

Increases

B

Decreases

C

Stays the same

D

None of the above

What is a reversible reaction?

A

A reaction where energy is given out to the surroundings

B

A reaction where energy is taken in from the surroundings

C

A reaction where products can react to produce the original reactants

D

A reaction where both forward and reverse reactions happen at the same rate

If the forward reaction is exothermic, the reverse reaction is...

A

Endothermic

B

Exothermic

C

Neither endothermic or exothermic

D

Hard to tell

What is ‘dynamic equilibrium’?

A

The point where forward and reverse reactions happen at the same time in a closed system

B

The point where forward and reverse reactions happen at the same rate in a closed system

C

The point where forward and reverse reactions happen at the same temperature

D

The point where forward and reverse reactions happen at the same rate in an open system

Multiple choice quiz answers

In an endothermic reaction, energy is...

B

Taken in from the surroundings

What happens to the temperature of the surrounding during an exothermic reaction?

A

Increases

What is a reversible reaction?

C

A reaction where products can react to produce the original reactants

If the forward reaction is exothermic, the reverse reaction is...

A

Endothermic

What is ‘dynamic equilibrium’?

B

The point where forward and reverse reactions happen at the same rate in a closed system

Exam style questions

Exam style question 1

Ethanol is manufactured from ethene and water as shown below:

$$C_2H_4(g) + H_2O(g) \quad \square \quad C_2H_5OH(g)$$

1) Write the correct symbol in the equation above to show that it is a reversible reaction.
2) The temperature of the reaction can be changed to increase the formation of ethanol at equilibrium. Explain what equilibrium means.
3) A catalyst can be added to increase the rate of reaction. Explain how the presence of catalysts increases the rate reaction.

Exam style question 2

Cobalt chloride paper contains anhydrous cobalt chloride, this is used to test for the presence of water. The following equation shows the reaction between anhydrous cobalt chloride and water:

$$\underset{\text{(blue)}}{CoCl_2} + 6H_2O \rightleftharpoons \underset{\text{(pink)}}{CoCl_2.6H_2O}$$

1) What does the ⇌ symbol mean in this reaction?
2) Describe the colour change for cobalt chloride when water is added.
3) Unused cobalt chloride paper is kept in a closed jar. What does a ‘closed system’ mean?

Exam style question 1 answer

Ethanol is manufactured from ethene and water as shown below:

$$C_2H_4(g) + H_2O(g) \rightleftharpoons C_2H_5OH(g)$$

1) Write the correct symbol in the equation above to show that it is a reversible reaction.
2) *Equilibrium is reached when the forward and reverse reactions occur at exactly the same rate in a closed system.*
3) *A catalyst lowers the activation energy and provides an alternative pathway so less energy is needed for particles to react.*

Exam style question 2 answer

Cobalt chloride paper contains anhydrous cobalt chloride, this is used to test for the presence of water. The following equation shows the reaction between anhydrous cobalt chloride and water:

$$\underset{\text{(blue)}}{CoCl_2} + 6H_2O \rightleftharpoons \underset{\text{(pink)}}{CoCl_2.6H_2O}$$

1) *The ⇌ symbol means the reaction is reversible.*
2) *Blue to pink.*
3) *A closed system is where none of the reactants or products can enter or escape.*