OCR
Oxford Cambridge and RSA

# GCSE Chemistry A (Gateway Science)

**J248/02** C4-C6 and C7 Foundation (Foundation Tier)

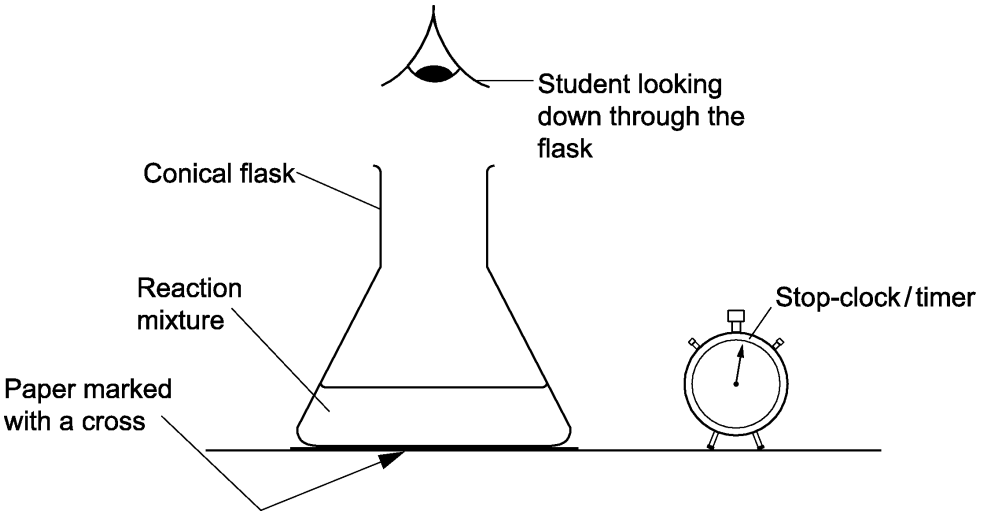
## Question Set 2

Multiple Choice Questions

C5: Monitoring and controlling chemical reactions

**1** A student investigates the reaction between sodium thiosulfate and hydrochloric acid.

Look at the diagram below. It shows the apparatus he uses.




- After a time he cannot see the cross because the liquid in the conical flask goes cloudy. The student measures the time taken until the cross **cannot** be seen.
- He does the experiment four times. For each experiment he uses a different concentration of sodium thiosulfate solution.

Which of the following must **not** be changed to do a fair test?

**A** Concentration of sodium thiosulfate

**B** Stop-clock or timer

**C** Total volume of the reaction mixture

**D** Volume of sodium thiosulfate added

Your answer ☐ **[1]**

**2** A student investigates the reaction between sodium carbonate and dilute nitric acid.

She does all the experiments using the

- same temperature
- same mass of sodium carbonate
- same volume of nitric acid.

She uses four different concentrations (**A**, **B**, **C** and **D**) of nitric acid.

For each concentration, she measures the time for the reaction to complete. Which concentration of nitric acid gives the **fastest** reaction?

| Concentration | Time for reaction to complete (in seconds) |
|---|---|
| **A** | 41 |
| **B** | 74 |
| **C** | 135 |
| **D** | 67 |

Your answer ☐ **[1]**

**3** Urea, $(NH_2)_2CO$, is a fertiliser.

A student makes 1 mole of urea from 2 moles of ammonia. What is the mass of urea that the student makes?

**A** 43.0 g

**B** 44.0 g

**C** 58.0 g

**D** 60.0 g

Your answer ☐ **[1]**

**4** Which statement about catalysts is correct?

**A** A catalyst decreases the activation energy of a reaction.

**B** A catalyst increases the activation energy of a reaction.

**C** A catalyst increases the time for a reaction to go to completion.

**D** A catalyst slows down a reaction.

Your answer ☐ **[1]**

**5** Hydrogen gas can be made by reacting methane and steam ($H_2O$).

$CH_4 + H_2O \rightarrow 3H_2 + CO$

6 g of hydrogen gas can be made from 18 g of steam, $H_2O$.

How much hydrogen gas can be made from 3.6 g of steam, $H_2O$?

**A** 0.4 g

**B** 0.6 g

**C** 1.2 g

**D** 6.8 g

Your answer ☐ **[1]**

**6** Which statement is true for a reversible reaction when it is at dynamic equilibrium?

**A** The concentration of the products is increasing.

**B** The rate of the backward reaction is greater than the rate of the forward reaction.

**C** The rate of the forward reaction is equal to the rate of the backward reaction.

**D** The rate of the forward reaction is greater than the rate of the backward reaction.

Your answer ☐ **[1]**

**7** The rate of a reaction can be changed by adding a catalyst to the reaction mixture.

Which line of the table shows how the **rate of reaction** and the **mass of the catalyst** change as the reaction takes place?

| | Change in rate of reaction | Change in mass of catalyst |
|---|---|---|
| **A** | decreases | no change |
| **B** | no change | decreases |
| **C** | increases | no change |
| **D** | increases | decreases |

Your answer ☐ **[1]**

**8** Which statement describes the **atom economy** of a reaction?

**A** A measure of how many atoms in the reactants form the waste products.

**B** A measure of how many atoms in the reactants form the desired product.

**C** A measure of the actual yield of product compared to the predicted yield of product.

**D** A measure of how many atoms form waste products compared to desired products.

Your answer ☐ **[1]**

## Total Marks for Question Set 2: 8