

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use Total Task 2



General Certificate of Education
Advanced Subsidiary Examination
June 2013

Chemistry

CHM3X/PM2

Unit 3X AS Externally Marked Practical Assignment

Task Sheet 2

To be completed before the EMPA Written Test

For submission by 15 May 2013

For this paper you must have:

- a ruler
- a calculator.

An investigation of baking powder

Task 2 Determination of the enthalpy of neutralisation of sodium hydrogencarbonate

Baking powder contains sodium hydrogencarbonate. In this task, you will use hydrochloric acid to neutralise a sample of solid sodium hydrogencarbonate. You will measure the temperatures during this endothermic reaction and record your results.

Procedure

- **Wear eye protection at all times.**
- **Assume that all substances used are toxic and corrosive.**
- **Read all of the following instructions and then design two tables, on the Candidate Results Sheet for Task 2, to record your results.**

- 1 Rinse a burette with the 2.00 mol dm^{-3} hydrochloric acid provided. Set up the burette and use a funnel to fill it with this hydrochloric acid.
- 2 Use this burette to transfer precisely 30.0 cm^3 of the hydrochloric acid into a clean, dry plastic cup. Place this cup into a beaker to provide support and additional insulation.
- 3 Mount the thermometer in the cup using a clamp and stand. The bulb of the thermometer must be fully immersed in the solution. Place a stirrer in the cup.
- 4 Use a balance to weigh the total mass of the sodium hydrogencarbonate and the container provided. Record this mass to two decimal places.
- 5 Measure the temperature of the hydrochloric acid in the cup to one decimal place.

Have this temperature reading checked by your teacher.

- 6 When you are ready to start the experiment, stir the hydrochloric acid, measure the temperature and start the timer. Record this temperature in your table.
- 7 Continue to stir, measure and record the temperature at the first, second and third minutes.
- 8 At the fourth minute, add your weighed sample of sodium hydrogencarbonate. Stir the mixture gently to minimise any spray from the vigorous reaction but do **not** measure the temperature at the fourth minute. Keep your empty container.
- 9 Stir the mixture **gently** and **continuously** during the remainder of the experiment. Measure the temperature at the fifth minute. Then measure the temperature at each minute up to and including the tenth minute. Record each result in your table.
- 10 Weigh your empty container. Record this mass in your table.

You are **not** expected to do any further work in Task 2.
You will use your results in Section A of the Written Test.

Candidate Results Sheet for Task 2

Teacher Group

Results

Record your results in appropriate tables in the space below.

(7 marks)

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There are no questions printed on this page

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ANSWER IN THE SPACES PROVIDED**