

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use Total Task 1



General Certificate of Education  
Advanced Subsidiary Examination  
June 2010

## Chemistry

## CHM3X/PM1

**Unit 3X AS Externally Marked Practical Assignment  
Task Sheet 1**

**To be completed before Task Sheet 2.**

**For submission by 15 May 2010**

**For this paper you must have:**

- a ruler
- a calculator.

## The investigation of a glass cleaner

Aqueous ammonia is the main constituent in industrial glass cleaners. After use, safe disposal of the glass cleaner involves the neutralisation of the unreacted ammonia. The neutralisation process is exothermic.

This practical assessment is in two parts, Task 1 and Task 2.

In Task 1 you will measure a temperature change in order to determine the enthalpy change when the main constituent in the glass cleaner is neutralised.

In Task 2 you will complete a series of observation exercises on a solution obtained by neutralising the glass cleaner. The results of these exercises will allow you to identify the salt produced by this neutralisation.

### Task 1 Measurement of the temperature change

**Wear eye protection at all times.**

**For the purpose of this task assume that all of the solutions are toxic and corrosive.**

#### Procedure

**Read all of the instructions before designing a table for your temperature readings.**

1. Rinse a burette with the hydrochloric acid provided. Set up the burette and, using a funnel, fill it with the hydrochloric acid provided.
2. Using the burette, transfer  $25.0\text{ cm}^3$  of the hydrochloric acid to a clean, dry plastic cup.
3. Measure the temperature of the hydrochloric acid in the cup to one decimal place. Record your result in the space provided on the Candidate Results Sheet for Task 1.
4. Wash the thermometer with distilled or de-ionised water and dry the thermometer.
5. Using a pipette filler, rinse a pipette with the glass cleaner provided. Using this pipette and the filler, transfer  $25.0\text{ cm}^3$  of the glass cleaner to a second clean, dry plastic cup.
6. Place the plastic cup containing the glass cleaner in a beaker to provide support and additional insulation. 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.
7. Stir the glass cleaner in the cup and measure the temperature to one decimal place. Record your result in a table of your own design on the Candidate Results Sheet for Task 1. Every minute for a further three minutes stir the solution, measure the temperature and record each result in your table.
8. At the fourth minute add the  $25.0\text{ cm}^3$  of hydrochloric acid from the plastic cup. Stir the mixture but do not record the temperature.
9. Continue to stir the mixture, and measure the temperature at the fifth minute, and then every subsequent minute for a further five minutes. Record each temperature in your table on the Candidate Results Sheet for Task 1.

**Candidate Results Sheet for Task 1**

Teacher Group .....

**Results**

Temperature of the hydrochloric acid / °C	
-------------------------------------------	--

Record your results from the enthalpy change experiment in a table of your own design in the space below.

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**There are no questions printed on this page**

**DO NOT WRITE ON THIS PAGE  
ANSWER IN THE SPACES PROVIDED**