

Sample assessment task

Chemistry – ATAR Year 11

Task 17 – Unit 2

Assessment type: Practical investigation

Conditions

Period allowed for completion of the task: 1.5 weeks

Task weighting

5% of the school mark for this pair of units

Determine which acid is the most reactive when reacted with metal carbonates. (24 marks)

The effect of acid rain on statues made from calcium carbonate is well documented.

The aim of this investigation is to determine if there is any difference in the reaction rate of different acids with metal carbonates.

Task description

1. Research what 'reaction rate' means and how you could measure it in a school laboratory (Suggestions: rate of mass loss during evolution of carbon dioxide, rate of evolution of carbon dioxide).
2. Brainstorm or discuss what 'most reactive' might mean. For example, it may mean the fastest reaction with another agent. Write down what you have decided 'most reactive' means and explain why you chose that way to define it.
3. Design a way to measure the reaction rates of the samples provided. Write a detailed description of your design, including the equipment and acids you intend to use, the dependent and independent variables, the measurements or observations you intend to make and how you propose to process your data.
4. Carry out your experimental work in your group.
5. Process the data on an individual basis. Show all working.
6. Write your report. This should include an introduction describing what 'reaction rate' and 'most reactive' mean; details of experimental designs; all raw measurements, calculations and observations in the 'Results' section; your conclusions; and evidence of the ways you minimised errors and uncertainties.

Time plan

Step	Day	Step	In-class/homework
1	1	Submit definition of 'most reactive'	20 min brainstorm/discussion
2	2	Group discussion of research ideas followed by individual submission of research design	Entire period
3	3	Carry out procedure and collect data (group)	Entire period
3	4	Carry out procedure and collect data (group)	Entire period
4	5	Process data (individual)	Entire period and homework
5	6	Submit report (individual)	Entire period

Marking key for sample assessment task 17 – Unit 2

Description	Marks
Research and submit research design <ul style="list-style-type: none"> evidence of individual research identification of variables viable experimental design 	1 1 1
Subtotal	/3
Carry out procedure and collect data <ul style="list-style-type: none"> selection of appropriate equipment safety precautions used during procedure all raw measurements recorded in an appropriate format evidence of fair testing 	1 1 1–2 1
Subtotal	/5
Processing data <ul style="list-style-type: none"> calculations and observations evaluation of data conclusions 	1–2 1–2 1–2
Subtotal	/6
Submit report <ul style="list-style-type: none"> information from research in introduction details of experimental design evidence of the ways you minimised errors and uncertainties report presented using appropriate format use of scientific terminology as appropriate 	1–2 1–2 1–2 1–2 1–2
Subtotal	/10
Total	/24