Chemistry HSC Assessment Task 1 ID #:_____

2007 HSC

Time Allowed: 45 minutes

- Write your answers in the spaces provided.
- The task is out of a total of 35 marks. The marks in brackets at the end of each question represent the value of that question.
- All diagrams must be drawn in pencil.

1. Around the room are TWO molecular models of carbon compounds, labelled A and B.

(a) Study the model labelled A.

(i) Identify its molecular formula. (1 mark)

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(ii) Identify its systematic (IUPAC) name (1 mark)

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(iii) Draw a three-dimensional representation of model A using the correct conventions. (2 marks)

(iv) Draw a segment, showing three monomer units, of the addition polymer that forms when carbon compound A is polymerised. Use a structural formula (not condensed) in your drawing. (2 marks)

(b) The carbon compound represented by the model labelled B is allowed to dehydrate in contact with a suitable catalyst.

(i) Identify the product(s) of this reaction. (1 mark)

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(ii) Identify an appropriate catalyst for this reaction in the laboratory. (1 mark)

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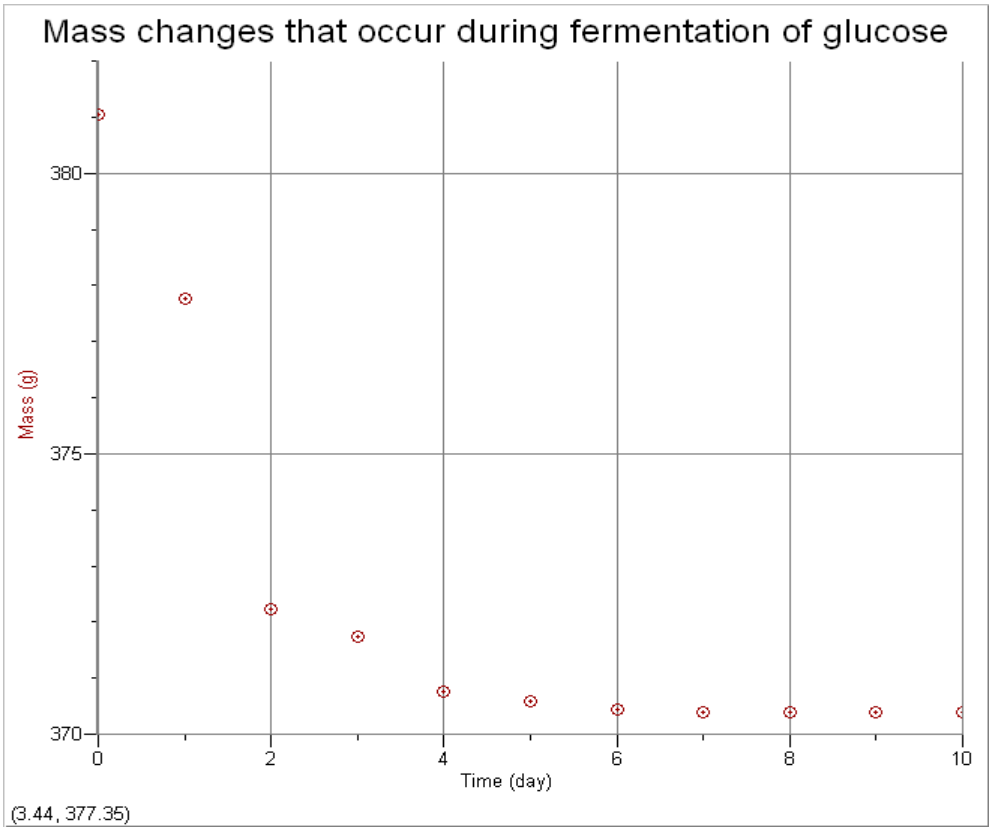
2. A student studying the mass change that occurs during the fermentation added glucose, water and yeast to a flask and stoppered the flask with some cotton wool.

The student measured the mass of the flask daily for ten days. The table shows the data collected.

Time (day)	Mass (g)
0	381.05
1	377.76
2	372.22
3	371.75
4	370.75
5	370.58
6	370.45
7	370.39
8	370.39
9	370.39
10	370.39

(a) The data collected above has been graphed below. Draw the line of best fit. (1 mark)



(b) Write a balanced equation, including states, for the fermentation process. (1 mark)

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(c) Calculate the moles of CO_2 released between days 0 and 10. (1 mark)

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(d) Calculate the mass of glucose that underwent fermentation between days 0 and 10. Show full working, including the appropriate symbol equations. (3 marks)

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(e) Account for the shape of the graph. (2 marks)

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3. The following are the results a student obtained when heating 175.0 g of water with propanol as the fuel for 2 minutes.

Initial mass of burner and fuel = 125.0 g
Mass of burner and fuel after 2 minutes = 119.7 g
Initial temperature of water = 22.1°C
Final temperature of water = 39.9°C

(a) Calculate the heat of combustion of propanol in kJ/mol. Include full working and ensure that your final answer has the appropriate number of significant figures. (4 marks)

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(b) Explain TWO safety procedures that should be implemented specifically related to potential risks and/or hazards involved in this first-hand investigation. (3 marks)

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4. You have performed an investigation to compare the reactivity of an alkene and its corresponding alkane using bromine water.
Write a scientific report on this investigation. (12 marks)

Your report should include:-

(1) Your method. (5)
(2) An outline of the observations you made. (3)
(3) An analysis of your results. (3)
(4) Your conclusion. (1)

KEY FOR MOLECULAR MODELS

BLACK = CARBON
WHITE = HYDROGEN
YELLOW = OXYGEN
RED = CHLORINE

PLEASE NOTE :

1. **Check the colour code key for the models in front of you as the colours used may not be what was used during normal class time.**

2. **As soon as you have collected enough information to answer all parts of question one, move back to your seat so that another student can use the models.**