

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature						Date					

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General Certificate of Secondary Education
June 2008 / June 2009



SCIENCE / CHEMISTRY
ISA C1.4 Testing Emulsions

SCYC/CHYC/C1.4

To be conducted before 4 May 2009
For submission in May 2008 or May 2009 or May 2010

<p>For this paper you must have:</p> <ul style="list-style-type: none"> • results tables and charts or graphs from your own investigation. <p>You may use a calculator.</p>

For Teacher's Use	
Section	Mark
1	
2	
Total (max 34)	

Time allowed: 45 minutes

Instructions

- Use blue or black ink or ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions in **Section 1** and **Section 2**.
- Answer the questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The maximum mark for this paper is 34.
- The marks for questions are shown in brackets.
- You are reminded of the need for good English and clear presentation in your answers.

Did this candidate take part in the practical activity?	YES / NO
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Signature of teacher marking this ISA Date

SECTION 1

These questions are about the investigation that **you** did.

Answer **all** questions in the spaces provided.

1 What were you trying to find out in your investigation?

.....
.....
.....
.....

(2 marks)

2 In your investigation:

(a) state **one** variable that it was important to keep the same;

.....

(1 mark)

(b) explain why it was important to keep this variable the same to make it a fair test.

.....
.....
.....
.....

(2 marks)

3 Which type of variable was your **independent** variable (the variable that you deliberately changed)?

Draw a ring around your answer.

categoric continuous discrete ordered

(1 mark)

4 Which of the variables that you measured in your investigation would give the biggest source of error?

.....

Explain your answer.

.....

.....

.....

.....

(2 marks)

5 How would you know if one of your repeated results was anomalous?

.....

.....

(1 mark)

6 Preliminary experiments are usually carried out before an investigation is started.

Suggest why it might be useful to carry out a preliminary experiment.

.....

.....

(1 mark)

7 What did you find out from your investigation?

I found out that

.....

.....

.....

(2 marks)

8 Make sure that **your** results tables and charts or graphs are handed in with this paper.

You will be awarded up to 6 marks for these.

(6 marks)

SECTION 2

These questions are about an investigation that may be similar to the one that you did.

Answer **all** questions in the spaces provided.

Ice cream is a frozen emulsion usually made from dairy products. A food company decided to make a new ice cream without using milk or cream.

The company's research department investigated different vegetable oils to see how easily they formed emulsions.

The scientists mixed oil and water in a bottle and added an emulsifier. They shook the bottles and checked to see whether a stable emulsion had formed. If the emulsion was still unstable, they added more emulsifier and repeated the shaking.

The total volume of the emulsifier needed to form a stable emulsion was recorded in **Table 1**.

Table 1

Oil	Volume of emulsifier needed to form a stable emulsion in cm ³			
	Test 1	Test 2	Test 3	Mean
olive	16	15	14	15
sunflower	41	39	52	40
sesame	17	19	24	18
peanut	39	42	36	39
coconut	28	26	26	

- 9 Which oil in **Table 1** gave the largest range of results?

.....
(1 mark)

- 10 Use **Table 1** to calculate the mean volume of emulsifier needed to form a stable emulsion for coconut oil.

Show clearly how you work out your answer.

.....
.....

Write your answer, to the nearest whole number, into the table.

(2 marks)

11 Choose **one** result in **Table 1** that should have been checked and tested again.

Result: Oil Test

Explain why you chose this result.

.....

.....

.....

.....

(2 marks)

12 What would the scientists **see** in a test-bottle if the emulsion was stable?

.....

.....

(1 mark)

13 Which **one** of the following would be the best way to present these results?

Put a tick (✓) in the box next to your choice.

Bar chart

Line graph

Pie chart

Scattergram

(1 mark)

14 The scientists measured the volumes of emulsifier and water using measuring cylinders.

(a) Suggest one other piece of equipment that they could use to make the measurement of volume more precise.

.....

(1 mark)

(b) Explain why you have chosen this piece of equipment.

.....

.....

(1 mark)

- 15** Every week, a new supply of oils is delivered to the food company and used to make ice cream.

The company expects each new supply of oils to behave in the same way as the oils used in its tests.

One week, the company had to throw away a complete batch of ice cream because the ice cream emulsion separated into oil and water before it could be frozen.

- (a) How could the company have avoided this separation problem?

.....

 (1 mark)

- (b) Explain why new supplies of oils may not give the same results as the company's original tests.

.....

 (1 mark)

Table 2 shows a list of the ingredients for two ice creams. The 'Dairy Ice Cream' is made from dairy products and the 'New Ice Cream' is made from a mixture of all the vegetable oils listed in **Table 1**.

Table 2

Dairy Ice Cream	New Ice Cream
Fresh whole milk	Vegetable oils
Skimmed milk powder	Sugar
16 % double cream	Emulsifier E471
Sugar	Flavouring
Eggs	Stabilisers E410, E412, E415
	Colours E100, E106b
Contains no artificial colours or preservatives	Contains non-milk fats and peanut products
Energy content: 950 kJ/100 g	Energy content: 791 kJ/100 g

Use the information in **Table 2** to answer questions 16 and 17.

- 16** In its advertising, the company claims that the vegetable oils used to make its new ice cream will be healthier for you and will not make you fat.

Discuss the claims made by the company. You should explain why you agree or disagree with the company’s claims.

To gain full marks in this question you should write your ideas in good English. Put them into a sensible order and use the correct scientific words.

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.....

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(3 marks)

- 17** The company decides to call its new ice cream ‘Traditional Farm Dairy Ice Cream’.

- (a) Suggest **one** reason why the company wants to use this name.

.....

.....

(1 mark)

- (b) Suggest **one** reason why this would mislead consumers.

.....

.....

(1 mark)

END OF QUESTIONS

There are no questions printed on this page