

Name:

Date:

C8 - Test 6  
CHEMICAL ANALYSIS  
Advanced

**GCSE**

CHEMISTRY

AQA - Combined Science

Mark

Grade

---

### Materials

For this paper you must have:

- Ruler
- Pencil and Rubber
- Scientific calculator, which you are expected to use when appropriate

### Instructions

- Answer all questions
- Answer questions in the space provided
- All working must be shown

### Information

- The marks for the questions are shown in brackets

1.

This is part of an article about food additives.

**THE PERIL OF FOOD ADDITIVES**

Some orange drinks contain the additives E102 (Tartrazine), E104 (Quinoline Yellow) and E110 (Sunset Yellow). These three coloured additives are thought to cause hyperactivity in children.

(a) State **two** reasons that a manufacturer might give to justify the use of these additives.

1. \_\_\_\_\_  
\_\_\_\_\_

2. \_\_\_\_\_  
\_\_\_\_\_

(2)

(b) Some scientists asked 4000 twelve-year-old children to help them investigate if there is a link between these three coloured additives and hyperactivity.

How would the scientists use these 4000 children to investigate if there is a link between these three coloured additives and hyperactivity in children?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(4)

(c) A manufacturer used an independent scientist to show that their orange drink did not contain these three coloured additives.

(i) Suggest why the manufacturer would use a scientist who was independent instead of using their own scientist.

\_\_\_\_\_  
\_\_\_\_\_

(1)

- (ii) The scientist had samples of E102, E104 and E110 and the orange drink. The scientist used paper chromatography for the test.

Describe how the scientist could use the results to show if the orange drink contained any of these three coloured additives.

You may include a diagram of the paper chromatography results.

---

---

---

---

---

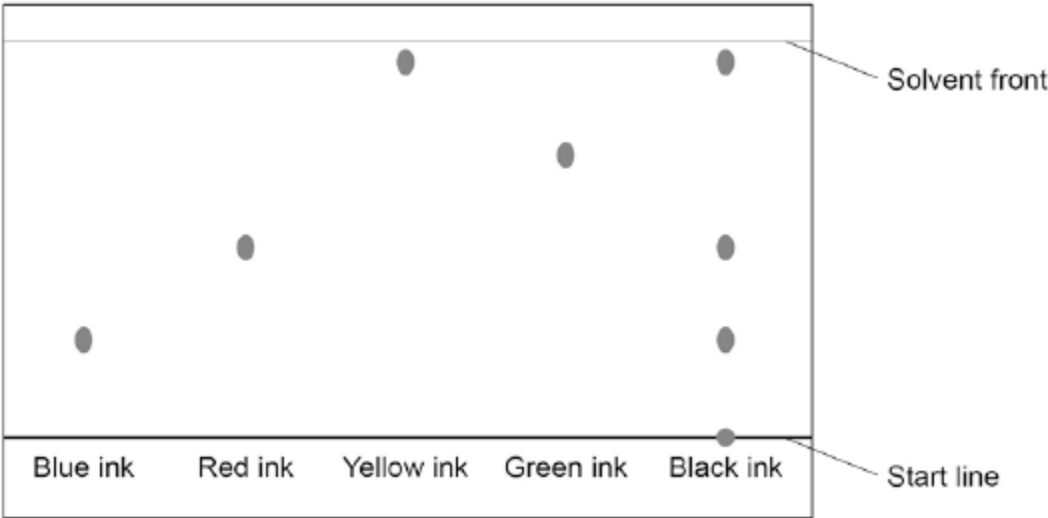
---

---

**(2)**  
**(Total 9 marks)**

2.

The figure below shows a paper chromatogram of five different inks.



(a) Explain how paper chromatography separates substances.

---

---

---

---

---

---

---

---

---

---

(3)

(b) Analyse the chromatogram. Describe and explain the result for black ink.

---

---

---

---

---

---

---

---

---

---

(4)

(c) Use the figure above to calculate the  $R_f$  value of the blue ink.

---

---

---

---

$R_f$  value = \_\_\_\_\_

**(3)**

**(Total 10 marks)**