0 5 This question is about mixtures.

0 5 . 1 Which substance is a mixture?

[1 mark]

Tick (✓) **one** box.

Air ☐   Gold ☐   Methane ☐   Nitrogen ☐

0 5 . 2 Food colourings are often mixtures of dyes.

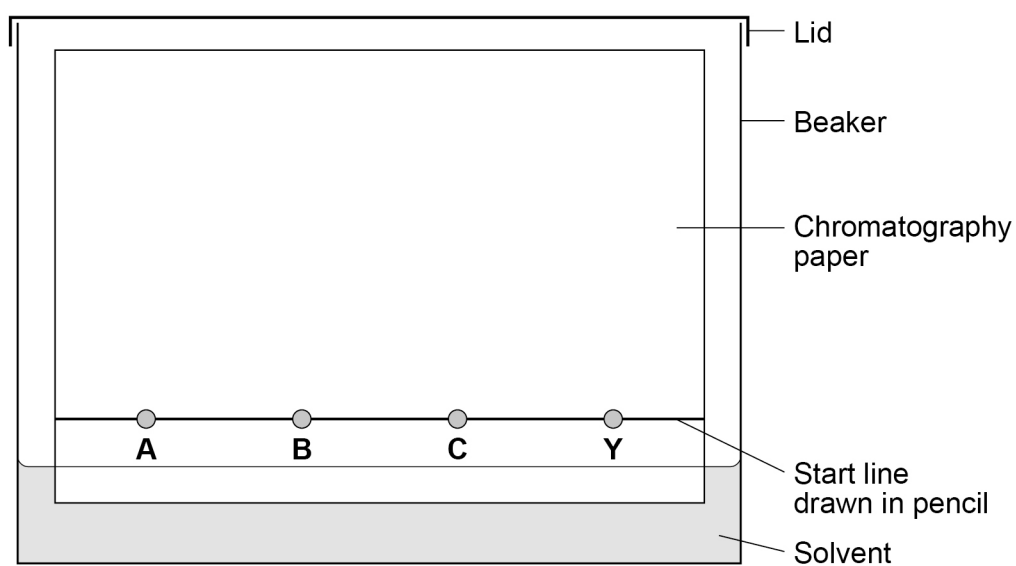What name is given to mixtures that are designed as useful products?

[1 mark]

_____

A student investigated a purple food colouring, **Y**, using chromatography.

The student compares **Y** with dyes **A**, **B** and **C**.

0 5 . 3 **Figure 8** shows the apparatus used.

Figure 8

Chromatography involves a stationary phase and a mobile phase.

Draw **one** line from each phase to what is used for that phase.

Use **Figure 8**.

[2 marks]

Phase	**What is used**

Beaker

Chromatography paper

Mobile phase

Food colouring

Stationary phase

Pencil line

Solvent

Question 5 continues on the next page

Turn over ▶

Figure 9 shows the student's results.

Figure 9

Dye **A**	Dye **B**	Dye **C**	Food colouring **Y**

0 5 . 4 What **three** conclusions can you make about the dyes in food colouring **Y**?

[3 marks]

1 _____

_____

2 _____

_____

3 _____

_____

0 5 . 5 In a different experiment a student recorded these results:

Distance moved by dye **G**   =   60 mm

Distance moved by solvent   =   80 mm

Calculate the R_f value of dye **G**.

$$R_f = \frac{\text{distance moved by dye } \mathbf{G}}{\text{distance moved by solvent}}$$

[2 marks]

$R_f =$ _____

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Turn over for the next question

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	air		1	AO1 5.8.1.1
05.2	formulation(s)		1	AO1 5.8.1.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.3	additional line from a box on the left negates the mark for that box		1 1	AO2 5.8.1.3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.4	**Y** contains 3 dyes	allow colour for dyes	1	AO3 5.8.1.3
	Y contains 2 known dyes	allow **Y** contains **A** and **C**	1	
	Y contains an unknown dye	allow **Y** does not contain dye **B**	1	
	alternative approach:			
	Y contains 3 dyes (1)			
	Y contains 1 known dye (1)	allow **Y** contains dye **C**		
	Y contains 2 unknown dyes (1)	allow **Y** does not contain dyes **A** and **B**		

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05.5	$(R_f =) \frac{60}{80}$		1	AO2 5.8.1.3
	= 0.75	ignore units	1	

Total			9