

Limonene in fruit peels

Education in Chemistry

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Percentage of an amount

One of the molecules responsible for the citrus flavour in fruit such as lemons, oranges and mandarins is called limonene and it can be extracted and purified. The result is a strongly smelling clear oily liquid. Starting with 200 g of orange peel, 2.4 g of limonene was produced. What is the percentage of limonene in orange peel?

$$\begin{aligned} \text{percentage of limonene in orange peel} &= \frac{\text{part}}{\text{whole}} \times 100\% \\ &= \frac{2.4}{200} \times 100\% = 1.2\% \end{aligned}$$

To visualise this with a bar model consider the following diagram:



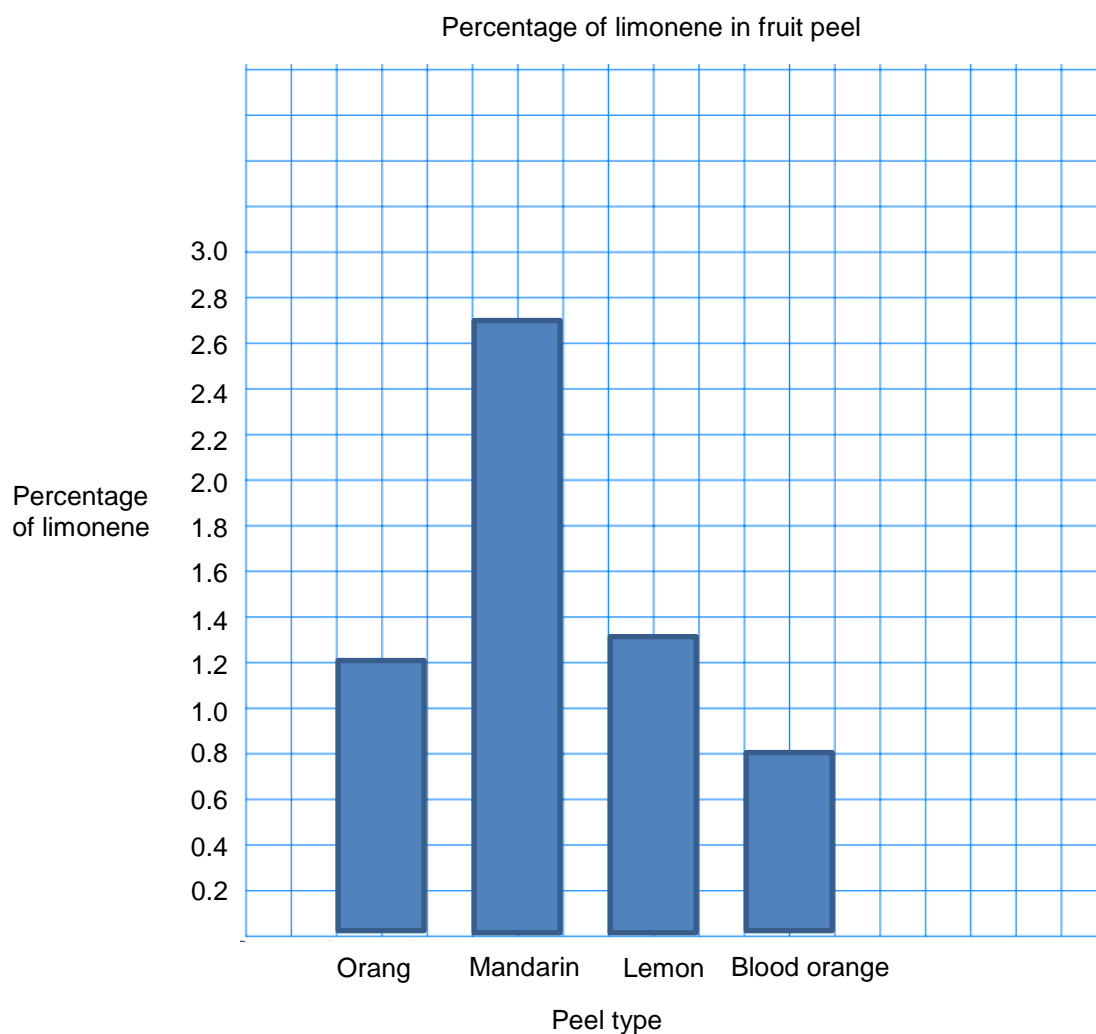
1) Complete the table to show the percentage of limonene in different fruit.

Fruit	Mass of limonene (g)	Mass of fruit peel (g)	Percentage
Orange	2.40	200	1.20
Mandarin	4.21	156	2.70
Lemon	1.59	122	1.30
Blood orange	1.67	209	0.80

2) What type of graph would be best to display the data?

A bar chart, because the data is in categories.

3) Draw an appropriate graph to display the data.



4) The percentage of limonene in lemons is typically about 1.8%. Complete the table to show the amount of limonene in different amounts of lemon peel.

Divide 97 by 100 to get 1%: = 0.97 g

Then scale up: $1.8 \times 0.97 \text{ g} = 1.75 \text{ g}$

Amount of lemon peel (g)	Amount of limonene (g)
97	1.75
28	0.50
164	2.95