

Student Learning Advisory Service

Contact us

Please come and see us if you need any academic advice or guidance.

Canterbury

Our offices are next to Santander Bank

Open

Monday to Friday, 09.00 – 17.00

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T: 01227 824016

Medway

We are based in room G0-09, in the Gillingham Building and in room DB034, in the Drill Hall Library.

Open

Monday to Friday, 09.00 – 17.00

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The Student Learning Advisory Service (SLAS) is part of the Unit for the Enhancement of Learning and Teaching (UELТ)

Acknowledgments

All materials checked by Dr Scott Wildman, Dr Cleopatra Branch, Jerome Durodie and Andrew Lea, Medway School of Pharmacy, Anson Building, Central Avenue, Chatham Maritime, Chatham, Kent. ME4 4TB.

This leaflet has been produced in conjunction with sigma Mathematics Support Centre



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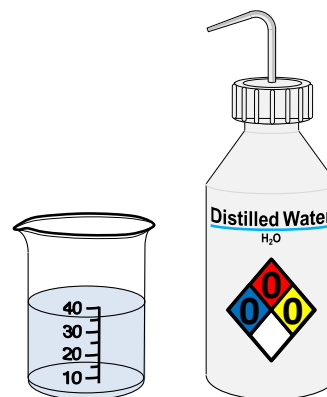
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AT A GLANCE/ PHARMACY CALCULATIONS DILUTING A % SOLUTION

Calculating how much base to add to a product to achieve a lower desired concentration.



Example 1

How much water should you add to 100mL of a 10% v/v solution to reduce it in strength to a 4% v/v solution?

Method

Step 1: Use $c_1 \times v_1 = c_2 \times v_2$ *percentages cancel out*

$$10(\%) \times 100 = 4(\%) \times x$$

Step 2: Transpose for x and solve

$$x = \frac{10 \times 100}{4} = 250\text{mL}$$

Step 3: Subtract the total original volume from the new volume

$$250\text{mL} - 100\text{mL} = 150\text{mL} \text{ (of water)} \checkmark$$

Example 2

How much water should you add to 150mL of a 0.4% v/v solution to reduce its strength to a 0.02% v/v solution?

Method

Step 1: Use $c_1 \times v_1 = c_2 \times v_2$ percentages cancel out

$$0.4 \text{ (\%)} \times 150 = 0.02 \text{ (\%)} \times x$$

Step 2: Transpose for x and solve

$$x = \frac{0.4 \times 150}{0.02} = 3000\text{mL}$$

Step 3: Subtract the total original volume from the new volume

$$3000\text{mL} - 150\text{mL} = 2850\text{mL} \text{ (of water)} \checkmark$$

Example 3

How much base should you add to 150g of a 30% w/w concentration to reduce its strength to a 20% w/w concentration?

Method

Step 1: Use $c_1 \times v_1 = c_2 \times v_2$ percentages cancel out

$$30 \text{ (\%)} \times 150 = 20 \text{ (\%)} \times x$$

Step 2: Transpose for x and solve

$$x = \frac{30 \times 150}{20} = 225\text{g}$$

Step 3: Subtract the total original amount from the new amount

$$225\text{g} - 150\text{g} = 75\text{g} \text{ (of base)} \checkmark$$

Q1

How much water should you add to 50mL of a 10% v/v solution to reduce it in strength to a 0.5% v/v solution?

Q2

How much water should you add to 1.2L of a 1% w/v solution to reduce it in strength to a 0.4% w/v solution?

Q3

You have 80g of a 15% w/w concentration. What weight of base should you add to reduce its strength 10% w/w?

Q4

You have 15mL of a 2% w/v solution. In order to reduce its strength to 0.4% w/v, how much solvent should you add?

Q5

What weight of base should be added to 12g of a 20% w/w concentration in order to produce a 12% w/w concentration?

Answers

Q1 = 950mL. **Q2** = 1800mL. **Q3** = 40g. **Q4** = 60mL.

Q5 = 8g