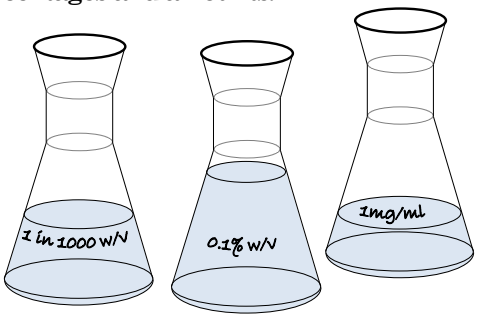
University of Kent | Student Learning Advisory Service

6

AT A GLANCE/ PHARMACY CALCULATIONS CONVERTING STRENGTHS

Converting a strength expressed in one measure to another – parts, percentages and amounts.



Example 1

What is 5% expressed as a ratio strength? (i.e., 1 part in ?)

Method

Step 1: Use $c_1/v_1 = c_2/v_2$ *

$$\frac{5}{100} = \frac{1}{x}$$

*Remember, %, ratio and amount strengths are fractions

Step 2: Transpose for x and solve

$$x = \frac{100}{5} = 20 \therefore 1\text{part in } 20$$ ✓

Example 2

What is 1 part in 500 expressed as a percentage?

Method

Step 1: Use $c_1/v_1 = c_2/v_2$

$$\frac{1}{500} = \frac{x}{100}$$

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
E: learning@kent.ac.uk
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
E: learningmedway@kent.ac.uk
T: 01634 888884

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

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** Network for Excellence in Mathematics and Statistics Support

sigma Σ network for excellence in mathematics and statistics support

kent.slas
@unikentSLAS
www.kent.ac.uk/learning

University of Kent | Student Learning Advisory Service

2: transpose for x and solve

$$x = \frac{100}{500} = \mathbf{0.2\%}$$ ✓

Example 3

What is 1mg/5mL expressed as a percentage?

Method

Step 1: Convert the amount to corresponding units

$$\frac{1mg}{5mL} = \frac{0.001g}{5mL}$$

Step 2: Use $c_1/v_1 = c_2/v_2$

$$\frac{0.001g}{5mL} = \frac{x\,(g)}{100mL}$$

Step 3: Transpose for x and solve

$$x = \frac{0.001 \times 100}{5} = 0.02 = \mathbf{0.02\%\ w/v}*$$ ✓

*Remember to insert the correct ratio units wherever possible – w/w, w/v, etc.

Example 4

What is 200mg/15mLexpressed as a ratio strength?

Method

Step 1: Convert the amount strength to corresponding units

$$\frac{200mg}{15mL} = \frac{0.2g}{15mL}$$

Step 2: Use $c_1/v_1 = c_2/v_2$

$$\frac{0.2g}{15mL} = \frac{1}{x}$$

Step 3: Transpose for x and solve

$$x = \frac{15 \times 1}{0.2} = 75 = \mathbf{1\ part\ in\ 75\ w/v}$$ ✓

Example 5

What is 40ppm expressed as an amount strength (mcg/mL)?

Method

Step 1: Use $c_1/v_1 = c_2/v_2$

$$\frac{40g}{1{,}000{,}000mL} = \frac{x}{1mL}$$

Step 2: Transpose for x and solve

$$x = \frac{40}{1{,}000{,}000} = 0.00004g = \mathbf{40mcg/mL}$$ ✓

Alternatively

$$\frac{40g}{1{,}000{,}000mL} = \frac{40{,}000{,}000mcg}{1{,}000{,}000mL} = \frac{\mathbf{40mcg}}{\mathbf{1mL}}$$ ✓

Q1

Convert the following:

a)	20% to a ratio strength
b)	4% to a ratio strength
c)	0.02% to a ratio strength
d)	2.5% to a ratio strength
e)	1 part in 400 to a % strength
f)	25ppm to a % strength
g)	25mcL/mL to a % strength
h)	5mcL/100mL to a ratio strength
i)	5% expressed as an amount strength (mg/mL)
j)	40mcg/100mL to ppm

Answers

Q1 a) = 1 part in 5. b) = 1 part in 25. c) = 1 part in 5000. d) = 1 part in 40. e) = 0.25%. f) = 0.0025%. g) = 2.5%. h) = 1 part in 20,000 . i) = 50mg/ml. j) = 0.4ppm