8. A 5-year-old child needs a dose of 125 mg cimetidine four times a day. The stock solution of cimetidine available contains 200 mg/5 ml. How many millilitres of this stock solution will be administered for each dose?

Percentage calculations

Percentages are also commonly used to express the strength of solutions. Usually these solutions are not intended for the oral route of administration.

As a percentage this can have four different meanings and in order to make clear the intention the following terms are used:

- **% w/w percentage weight in weight.** This expresses the amount in grams of solute in 100 g of product.
- **% w/v percentage weight in volume.** This expresses the amount in grams of solute in 100 ml of product.
- **% v/v percentage volume in volume.** This expresses the number of millilitres of solute in 100 ml of product.
- **% v/w percentage volume in weight.** This expresses the number of millilitres of solute in 100 g of product.

The strength of solutions of solids in liquids is usually expressed as % w/v, whereas that of liquids in liquids is expressed as % v/v. When the type of percentage is not specified by convention the above rule will apply. For example, % solid in liquid is interpreted as % w/v.

Example 2.7

Prepare 50 ml potassium permanganate solution 2.8%.

As Potassium Permanganate BP is a solid this would mean: prepare a solution containing potassium permanganate 2.8% w/v.

This means that there would be 2.8 g of Potassium Permanganate BP dissolved in every 100 ml of solution.

Potassium Permanganate BP	2.8 g	1.4 g
Freshly boiled and cooled purified water	to 100 ml	to 50 ml

Questions

What quantities would be required for the following?

9. 500 ml of a 0.1% w/v solution using a 20% w/v solution.

10. 5 l of a 0.9% w/v solution.

11. 20 ml of a 5% solution.

12. How much solid would be required in order to produce 50 ml of a 0.2% w/v solution?

a. 100 micrograms
b. 200 micrograms
c. 10 milligrams
d. 100 milligrams
e. 200 milligrams