COGLATA2-06

Prepare compounds and solutions for scientific or technical use

Overview

This standard covers the competences you need to prepare compounds and solutions for scientific or technical use in accordance with approved procedures and practices.

You will be required to demonstrate that you can measure, weigh and prepare compounds and solutions for scientific or technical use in accordance with workplace procedures.

The activity is likely to be undertaken by someone in a science related work setting, including individuals working in hospitals, scientific laboratories, schools and universities.

Performance criteria

You must be able to:

P1 ensure that your work is carried out in accordance with workplace procedures
P2 use safe practices and the appropriate personal protection equipment (PPE) when doing scientific or technical activities
P3 use balances for accurately weighing out materials
P4 Measure out required concentrations of liquids for scientific or technical use
P5 measure specific volumes of liquids and weights of solids for scientific or technical use
P6 communicate the required information about the work done, in accordance with departmental and organisational procedures

Knowledge and understanding

You need to know and understand:

K1 the health and safety requirements of the area in which you are carrying out the scientific or technical activities
K2 the implications of not taking account of legislation, regulations, standards and guidelines when conducting scientific or technical activities
K3 the scientific or technical techniques and processes you must use correctly in the workplace.
K4 the importance of wearing protective clothing, gloves and eye protection for scientific or technical activities
K5 the importance of correct identification, and any unique workplace coding system
K6 the lines of communication and responsibilities in your department, and their links with the rest of the organisation
K7 the limits of your own authority and to whom you should report if you have problems that you cannot resolve
K8 how to calculate mass/mole calculations
K9 how to convert between metric and imperial measures and vice versa
K10 how to select the appropriate balance and scale for less than 100mg, 100mg to 5g, and 5g and above
K11 how to check that your equipment is clean, dry, free of chips and ready for use
K12 how to measure and weigh solids and liquids for scientific or technical use
K13 how to convert between different units of concentration
K14 how to calculate dilution factors and dilution volumes to make solutions from concentrated stock solutions
K15 how to choose the appropriate measuring equipment for the scale, accuracy and precision required for the task
K16 how to clean and maintain weighing and measuring equipment

Scope/range

1. use two of the following types of protective clothing and equipment:
1.1 laboratory coat/apron/overall
1.2 gloves
1.3 full face visor or shield
1.4 dust mask/respirator
1.5 safety glasses or goggles
1.6 fume cupboard

2. carry out weighing activities using balances (scales), using two of the following accuracies:
2.1 grams
2.2 milligrams
2.3 micrograms

3. measure out solutions, using two of the following:
3.1 automated pipettes
3.2 burettes
3.3 graduated/bulb pipettes
3.4 volumetric flasks
3.5 syringes
3.6 other (please specify)
3.7 graduated cylinders/beakers/tubes

4. calculate the concentrations of solutions, the amounts and volumes required, using two of the following:
4.1 moles per litre
4.2 parts per million
4.3 other (please specify)
4.4 grams per litre
4.5 mass percent

5. make up known volumes of solutions to a specified concentration, using both of the following:
5.1 by measuring and dissolving the correct amount of solid in the correct volume of diluent/solvent
5.2 by dilution from a concentrated stock solution

6. weigh and prepare three of the following types of compound or solution:
6.1 solids that do not readily lose or gain weight (moisture or solvent)
6.2 solids that readily lose or gain weight (moisture or solvent)
6.3 solutions (by dilution from a known concentration)
6.4 solutions (at actual molecular weight)

7. record details of the work, and communicate the details to the appropriate people, using:

7.1 verbal report plus one method from the following:
7.2 written or typed report (eg, laboratory notebook)
7.3 computer-based record
7.4 specific workplace documentation
7.5 electronic mail

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