



Australian Government

MSL974032 Perform chemical tests and procedures

Release: 1

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Modification History

Release 1. Supersedes and equivalent to MSL974019 Perform chemical tests and procedures. Element 7 integrated into Element 5. Minor changes to Performance Criteria. Minor refinements in Knowledge Evidence to provide guidance about scope and depth of knowledge required.

Application

This unit of competency describes the skills and knowledge to interpret chemical test requirements, prepare samples, conduct pre-use and calibration checks on equipment and perform routine chemical tests. These tests will involve several measurement steps. The unit includes basic data processing and interpretation of results.

This unit applies to laboratory or technical assistants and instrument operators in all industry sectors.

No licensing or certification requirements exist at the time of publication. However, regulations and/or external accreditation requirements for laboratory operations exist, so local requirements should be checked. Relevant legislation, industry standards and codes of practice within Australia must also be applied.

Pre-requisite Unit

Nil.

Competency Field

Testing

Elements and Performance Criteria

Elements	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Interpret and schedule test requirements	1.1 Review test request to identify samples to be tested, test method and equipment involved 1.2 Identify hazards and workplace control measures associated with the sample, preparation and test methods, reagents and/or equipment 1.3 Plan work sequences to optimise throughput of multiple samples
2. Receive and prepare	2.1 Register samples in accordance with workplace procedures, recording details that allow accurate tracking and chain of custody

Elements	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
samples	traceable to employee 2.2 Match sample provided to accompanying documentation and report any discrepancies in accordance with workplace procedures 2.3 Prepare samples and standards in accordance with chemical testing requirements
3. Check equipment before use	3.1 Set up equipment and instruments in accordance with test method requirements 3.2 Perform pre-use and safety checks in accordance with workplace procedures 3.3 Check equipment calibration using specified standards and procedures 3.4 Inspect reagents required for quality issues including visual checks and expiry 3.5 Maintain equipment log in accordance with workplace procedures
4. Test samples to determine chemical species or properties	4.1 Operate equipment and instruments in accordance with test method requirements 4.2 Perform tests or procedures on all samples and standards in accordance with specified methods 4.3 Shut down equipment and instruments in accordance with operating procedures
5. Process, interpret and record data	5.1 Record test data noting atypical observations and anomalies 5.2 Interpret calibration graphs and compute results for all samples from these graphs 5.3 Check calculated values for consistency with expectations 5.4 Record data and results in accordance with workplace procedures 5.5 Determine if obvious procedure or equipment problems have led to atypical data or results 5.6 Follow procedures to ensure traceability of sample from receipt to reporting of results
6. Maintain a safe work environment	6.1 Use established safe work practices and personal protective equipment (PPE) to ensure personal safety and that of other laboratory personnel 6.2 Minimise the generation of wastes and environmental impacts

Elements	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
	6.3 Safely collect and dispose of laboratory and hazardous waste 6.4 Care for and store equipment and reagents in accordance with workplace procedures

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance:

- Problem-solving skills to trace and source obvious causes of artefacts, track obvious test malfunctions for standardised procedures, and troubleshoot basic equipment and methods.

Other foundation skills essential to performance are explicit in the performance criteria of this unit.

Unit Mapping Information

Supersedes and is equivalent to MSL974019 Perform chemical tests and procedures.

Links

MSL Laboratory Operations Companion Volume Implementation Guide is available from VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5c63a03b-4a6b-4ae5-9560-1e3c5f462baa>

Assessment Requirements for MSL974032 Perform chemical tests and procedures

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Performance Evidence

There must be evidence the candidate has completed the tasks outlined in the elements and performance criteria of this unit, and:

- safely performed at least 3 different multi-step chemical tests including at least 1 of the following:
 - colorimetric techniques
 - spectrometric techniques
 - chromatographic techniques
 - electrochemical techniques
 - electrophoretic techniques
 - soil testing techniques
 - gravimetric analysis
 - titrimetric analysis
 - filtration, separation and solvent extraction techniques
 - corrosion testing, cement content and accelerated weathering.
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Knowledge Evidence

There must be evidence the candidate has knowledge of:

- basic aspects of chemical principles and concepts, including:
 - elements, compounds, ions, atoms, molecules, bonding and links to chemical properties
 - periodic table and system for symbols of elements
 - atomic mass and molecular weight
 - moles and molarity
 - chemical formulae and balancing equations
 - chemical reactions
 - energy levels and absorption/emission spectra
- purpose and principles of tests and/or procedures performed as part of job role
- international system of units (SI)

- principles and concepts related to equipment and instrument operation, tests and/or procedures
- requirements for cleaning up spills and reporting faulty or unsafe equipment, hazards and incidents.
- concepts of metrology, including:
 - all measurements are estimates
 - precision, accuracy and significant figures
 - sources of error, uncertainty and repeatability
 - traceability
- function of key components of the equipment and instrument and reagents and effects of modifying equipment and instrument variables
- common causes of analytical errors
- calibration requirements and basic equipment and method troubleshooting procedures
- sample preparation procedures for the tests and/or procedures conducted
- traceability requirements
- awareness of environmental sustainability issues as they relate to the work task
- legal, ethical and work health and safety (WHS) requirements specific to the work task.
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Assessment Conditions

Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies. The following conditions must be met for this unit:

- use of suitable facilities, equipment and resources, including:
 - a standard laboratory equipped with appropriate sample preparation and test equipment, instruments, standards and reagents
 - records, including test and calibration results; equipment use, maintenance and servicing history, and faulty or unsafe equipment
 - workplace procedures.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

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