



Australian Government

MSL975067 Perform complex tests to measure chemical properties of materials

Release: 1

MSL975067 Perform complex tests to measure chemical properties of materials

Modification History

Release 1. Supersedes and equivalent to MSL975046 Perform complex tests to measure chemical properties of materials. Element 6 integrated into Element 5. Minor changes to Performance Criteria. Removal of duplicating items in Knowledge Evidence.

Application

This unit of competency describes the skills and knowledge to isolate analytes from complex matrices and perform multi-staged and multi-component analyses on them. The unit requires personnel to apply detailed knowledge of analytical chemistry to plan the analysis, prepare and measure samples, analyse and report results and make approved adjustments to procedures as required. Personnel are required to recognise atypical test data and results and troubleshoot common analytical procedure and equipment problems.

This unit applies to technical working in all industry sectors. All operations must comply with relevant standards, appropriate procedures and workplace requirements. Although a supervisor may not always be present, the technician will follow workplace procedures that clearly describe the scope of permitted practice, including varying workplace/test procedures and communicating results to people outside the laboratory.

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

MSL974032 Perform chemical tests and procedures.

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. Develop an analysis plan with supervisor	1.1 Liaise with client or sample provider to determine test requirements and sample characteristics 1.2 Match sample provided to accompanying documentation and report

Elements	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
	any discrepancies in accordance with workplace procedures 1.3 Confirm suitable sample preparation methods, quantification and analytical techniques with supervisor
2. Reduce the complexity of the sample	2.1 Obtain a representative analytical portion of the laboratory sample 2.2 Prepare validation checks for analytical portions 2.3 Use workplace procedures to simplify the sample matrix 2.4 Conduct tests to ensure that sample preparation is complete
3. Apply quantification method	3.1 Add modifiers to remove or minimise interferences 3.2 Conduct preliminary analysis to estimate analyte concentration 3.3 Match the concentration of analyte in the sample with the working range of the instrument 3.4 Prepare calibration standards to suit quantification method
4. Perform analysis	4.1 Set up and optimise instruments to suit sample and test requirements 4.2 Measure analyte response for standards, validation checks and samples 4.3 Conduct sufficient measurements to obtain reliable data 4.4 Return instruments to standby or shutdown condition in accordance with workplace procedures
5. Process, analyse and record data	5.1 Confirm data is the result of valid measurements 5.2 Perform required calculations and ensure results are consistent with estimations and expectations 5.3 Record results with the appropriate accuracy, precision units and uncertainty 5.4 Analyse trends in data and/or results and report out-of-specification or atypical results promptly to appropriate personnel 5.5 Troubleshoot analytical procedure or equipment problems which have led to atypical data or results 5.6 Follow procedures to ensure traceability of sample from receipt to reporting of results

Foundation Skills

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

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Unit Mapping Information

Supersedes and is equivalent to MSL975046 Perform complex tests to measure chemical properties of materials.

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 MSL975067 Perform complex tests to measure chemical properties of materials

Modification History

Release 1. Supersedes and equivalent to MSL975046 Perform complex tests to measure chemical properties of materials. Element 6 integrated into Element 5. Minor changes to Performance Criteria. Removal of duplicating items in Knowledge Evidence.

Performance Evidence

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

- isolated analytes from 3 different complex matrices and performed multi-staged and/or multi-component analysis on each.
-

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- principles and concepts underpinning the analysis:
 - nature of specific sample matrices
 - effects of interferents with analyte behaviour, including ionisation, complexation, precipitation, masking and association
 - quantification methods
 - chemical and physical treatments to minimise interferences
- special needs for sample treatment or pre-treatment
- function of key components of equipment and effects of modifying instrumental variables on outputs and results
- typical analytes and samples requiring complex tests
- typical tests for completeness of sample preparation:
 - visual inspection for colour and solids
 - odour
 - pH and conductivity
 - chemical tests for interferents, such as precipitation and colour forming
 - basic screening instrumental tests
- application of chemical modifiers
- sample preparation procedures used for analyses
- basic equipment maintenance procedures
- calculation steps to give results in appropriate units, precision and uncertainty
- 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 including traceability, confidentiality and security requirements of all client information, and laboratory data and records.
-

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
 - specialised analytical instruments, laboratory reagents and equipment
 - workplace procedures and test methods.

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

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>