

Specification of Competency Standards
for the Testing, Inspection and Certification Industry
Unit of Competency

Functional Area - Testing Operations

Title	Apply molecular spectrometric techniques to chemical testing
Code	105787L4
Range	This unit of competency (UoC) covers the abilities to optimise and operate molecular spectrometric instruments independently, record and analyse test data accurately for chemical analysis by applying the principles of molecular spectrometry in testing laboratories.
Level	4
Credit	6 (For Reference Only)
Competency	<p>Performance Requirements</p> <p>1.Possess knowledge of molecular spectrometric techniques</p> <ul style="list-style-type: none"> • Apply the principles and concepts of molecular spectrometric techniques to chemical analysis. • Describe the construction and explain the functions of key components (e.g. sources, monochromators, sample holders, detectors) of molecular spectrometric instruments including: <ul style="list-style-type: none"> ○ ultraviolet/visible (UV/Vis) spectrometer, ○ Fourier Transform infrared (FT-IR) spectrometer, ○ molecular fluorescence spectrometer. • Describe the operation, selectivity, sensitivity, linear range, typical applications and interferences (e.g. spectral interferences) of molecular spectrometric instruments. • Describe the procedures of carrying out routine performance check of molecular spectrometric instruments. • Outline the steps of applying molecular spectrometric techniques for identifying and quantifying analytes to give results in appropriate accuracy, precision, uncertainty and units. • Differentiate the applications of various types of molecular spectrometric techniques for qualitative and quantitative analysis according to the nature and characteristics of samples and analytes. • Apply the concepts of uncertainty and instrument calibration to molecular spectrometric analysis. <p>2.Apply and operate molecular spectrometric instruments for chemical analysis</p> <ul style="list-style-type: none"> • Determine the test request and identify sample characteristics that may affect the chemical analysis. • Select appropriate test method and molecular spectrometric instrument in compliance with test requirements. • Carry out routine performance check of the selected molecular spectrometric instrument according to manufacturer’s instruction and/or relevant standard to ensure it is ready for chemical analysis. • Set up the molecular spectrometric instrument and optimise its performance by using appropriate calibration standards and adjusting instrumental operating parameters. • Carry out molecular spectrometric analysis on the sample independently according to the test method by measuring analyte responses for standards, validation and quality control checks, and the sample. • Record accurate and reliable molecular spectrometric data by conducting sufficient measurements. • Analyse molecular spectrometric data for chemical analysis. <p>3.Exhibit professionalism</p>

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	<ul style="list-style-type: none">• Troubleshoot analytical procedures or molecular spectrometric instruments in case of any atypical observations/data/results being identified during sample analysis or performance check.• Ensure integrity and confidentiality of laboratory data and information by observing the code of conduct of the laboratory.
Assessment Criteria	<p>The integrated outcome requirements of this UoC are the abilities to:</p> <ul style="list-style-type: none">• apply, optimise and operate the molecular spectrometric instrument independently to carry out chemical analysis of the sample according to the test method and sample characteristics,• record accurate and reliable molecular spectrometric data by conducting sufficient measurements,• analyse molecular spectrometric data by verifying validation and quality control check data.
Remark	