



REPUBLIC OF KENYA

NATIONAL OCCUPATIONAL STANDARD

FOR

ANALYTICAL CHEMISTRY TECHNICIAN

KNQF LEVEL 6

OCCUPATION STANDARD ISCED CODE: 0531 554A

PERFORM CLASSICAL ANALYSIS TECHNIQUES

ISCED UNIT CODE: 0531 551 12A

TVET CDACC UNIT CODE: ASC/OS/ACHEM/CR/02/6/MA

UNIT DESCRIPTION

This unit covers the competencies required in performing classical analysis techniques. It involves standardizing reagents, carrying-out volumetric analysis, gravimetric analysis and proximate analysis.

ELEMENT AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make up laboratory function	These are assessable statements which specify the required level of performance for each of the elements. <i>(Bold and italicized terms are elaborated in the Range)</i>
1. Standardize reagents	1.1 Apparatus for standardizing reagents is assembled as per laboratory manual. 1.2 Reagents are selected based on chemistry laboratory manual. 1.3 Reagent concentrations are calculated based on standard chemical formulae 1.4 Reagents are measured as per chemistry laboratory manual. 1.5 Reagent solutions are prepared as per chemistry laboratory manual. 1.6 Reagent solutions are transferred to a labeled reagent bottle as per chemistry laboratory manual.
2. Carry-out Volumetric Analysis	2.1 Apparatus for volumetric analysis is assembled as per chemistry laboratory manual.

	<p>2.2 <i>Standard solutions</i> are prepared as per chemistry laboratory manual.</p> <p>2.3 Titrations are performed as per chemistry laboratory manual.</p> <p>2.4 Unknown concentrations are determined as per standard chemical formulae</p>
3. Carry out Gravimetric Analysis	<p>3.1 Apparatus for gravimetric analysis is assembled as per laboratory manual.</p> <p>3.2 Samples are weighed as per chemistry laboratory manual.</p> <p>3.3 Samples are prepared as per chemistry laboratory manual.</p> <p>3.4 Analytes are precipitated as per chemistry laboratory manual.</p> <p>3.5 Precipitated analytes are filtered as per chemistry laboratory manual.</p> <p>3.6 Precipitated analytes are washed as per chemistry laboratory manual.</p> <p>3.7 Precipitated analytes are dried as per chemistry laboratory manual.</p> <p>3.8 Precipitated analytes are ignited as per chemistry laboratory manual.</p> <p>3.9 Precipitated analytes are weighed as per chemistry laboratory manual.</p> <p>3.10 Concentrations are determined per chemistry standard chemical formulae</p>
4. Carry out Proximate Analysis	<p>4.1 Apparatus and equipment required are assembled as per chemistry laboratory manual.</p>

	<p>4.2 Reagents are selected based on biological components being analyzed</p> <p>4.3 <i>Biological samples</i> are tested as per chemistry laboratory manual.</p>
--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------

RANGE

This section provides a work environment and conditions to which the performance criteria apply. It allows for a different work environment and situations that will affect performance.

Variable	Range
1. Standard solutions	<ul style="list-style-type: none"> • Buffer solutions • Working standards. • Stock solutions
2. Biologicals components	<ul style="list-style-type: none"> • Carbohydrates • Lipids • Proteins

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Communication skills
- Computer skills
- Problem solving

- Record keeping

Required Knowledge

The individual needs to demonstrate knowledge of:

- Preparation of solution
- Preparation of samples
- Separation of the analyte
- Computation of the analyte concentration

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

<p>1. Critical aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Prepared reagents as per chemistry laboratory manual. 1.2 Prepared standard solutions as per chemistry laboratory manual. 1.3 Performed titrations as per chemistry laboratory manual. 1.4 Prepared samples as per chemistry laboratory manual. 1.5 Precipitated analytes as per chemistry laboratory manual.
------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

	<p>1.6 Processed precipitate as per chemistry laboratory manual.</p> <p>1.7 Tested biological samples as per chemistry laboratory manual.</p>
2. Resource Implications	<p>The following resources should be provided:</p> <p>2.1 Access to relevant workplace</p> <p>2.2 Appropriately simulated environment where assessment can take place</p> <p>2.3 Materials relevant to the proposed activity or tasks</p>
3. Methods of Assessment	<p>Competency in this unit may be assessed through:</p> <p>3.1 Practical test</p> <p>3.2 Written test</p> <p>3.3 Third party report</p> <p>3.3 Case studies</p> <p>3.4 Project report</p>
4. Context of Assessment	<p>Competency may be assessed:</p> <p>4.1 workplace</p> <p>4.3 Simulated laboratory environment</p>
5. Guidance information for assessment	<p>5.1 Holistic assessment with other units relevant to the industry sector, laboratory and job role is recommended.</p>