
**REPUBLIC OF KENYA**

# NATIONAL OCCUPATIONAL STANDARD

**FOR**

# ANALYTICAL CHEMISTRY TECHNICIAN

**KNQF LEVEL 6**

**OCCUPATION STANDARD ISCED CODE: 0531 554A**

**PERFORM CHEMICAL SEPARATION**

**ISCED UNIT CODE: 0531 551 15A**

**TVET CDACC UNIT CODE: ASC/OS/ACHEM/CR/05/6/MA**

## UNIT DESCRIPTION

This unit covers the competencies required in performing chemical separation. It involves carrying out extraction, filtration, distillation and chromatography.

## ELEMENT AND PERFORMANCE CRITERIA

| **ELEMENT**<br>These describe the key outcomes which make up laboratory function | **PERFORMANCE CRITERIA**<br>These are assessable statements which specify the required level of performance for each of the elements.<br>***Bold and italicized terms are elaborated in the Range*** |
|---|---|
| 1.Carry out Extraction | 1.1 ***Apparatus and equipment*** are set up as per laboratory manual.<br>1.2 ***Solvents*** are prepared as per laboratory manual.<br>1.3 Analytes are extracted as per laboratory manual.<br>1.4 Extracts are tested as per laboratory manual. |
| 2. Carry out Filtration | 2.1 Apparatus and equipment are set up as per laboratory manual.<br>2.2 Samples are prepared as per laboratory manual.<br>2.3 Analytes are filtered as per laboratory manual.<br>2.4 Filtered analytes are tested as per laboratory manual. |
| 3. Carry out distillation | 3.1 Apparatus and equipment are set up as per laboratory manual.<br>3.2 Samples are prepared as per laboratory manual. |

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|---|---|
| | 3.3 Analytes are distilled as per laboratory manual.<br>3.4 Distillates are tested as per laboratory manual. |
| 4. Carry out Chromatography | 4.1 Apparatus and equipment for ***chromatography*** are set up as per laboratory manual.<br>4.2 Samples are prepared as per laboratory manual.<br>4.3 Analytes are separated as per laboratory manual.<br>4.4 Analytes are tested as per laboratory manual. |

**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. Apparatus and equipment | • Separating Funnel<br>• Soxhlet apparatus<br>• Distillation apparatus<br>• Water bath<br>• Heating mantle<br>• TLC plates |
| 2. Solvents | • Ethanol<br>• Chloroform<br>• Acetone<br>• Diethyl ether |
| 3. Chromatography | • Paper Chromatography<br>• Thin layer Chromatography<br>• High Performance Chromatography<br>• Gas Chromatography |

## 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
- Taking measurements
- Computer skills
- Observation skills
- Sample handling skills
- Required Knowledge

### Required knowledge

The individual needs to demonstrate knowledge of:

- Basic extraction techniques
- Safety precautions
- Principles. of distillation

## EVIDENCE GUIDE

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

| | |
|---|---|
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:<br>1.1 Prepared solvents as per chemistry laboratory manual.<br>1.2 Prepared samples as per chemistry laboratory manual.<br>1.3 Separated analytes as per chemistry laboratory manual.<br>1.4 Tested analytes as per chemistry laboratory manual. |
| 2. Resource Implications | The following resources should be provided:<br>2.1 Access to relevant workplace<br>2.2 Appropriately simulated environment where assessment can take place<br>2.3 Materials relevant to the proposed activity or tasks |
| 3. Methods of Assessment | Competency in this unit may be assessed through:<br>3.1 Written tests<br>3.2 Observation (practical and projects)<br>3.3 Third party reports |
| 4. Context of Assessment | Competency may be assessed:<br>4.1 Workplace<br>3.1 Simulated laboratory environment |
| 5. Guidance information for assessment | 5.1 Holistic assessment with other units relevant to the industry sector, laboratory and job role is recommended. |