

APPLY ORGANIC AND INORGANIC CHEMISTRY

ISCED UNIT CODE: 0531 441 05A

TVET CDACC CODE: ENV/OS/ENT/CC/01/5/MA

UNIT DESCRIPTION

This unit covers the competencies required to apply inorganic and organic chemistry, it involves applying physical chemistry principles, applying inorganic chemistry concepts, applying organic chemistry concepts

ELEMENTS AND PERFORMANCE CRITERIA

| ELEMENT These describe the key outcomes which make up workplace functions | PERFORMANCE CRITERIA 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. Apply physical chemistry principles | 1.1 Acid and bases properties are applied as per acid-base theory. 1.2 Salts properties are applied as per salt solubility rules 1.3 Ionic and chemical equilibrium properties are applied as per physical chemistry theory. 1.4 Reaction kinetics properties are applied as per physical chemistry theory. 1.5 Gas properties are applied as per Kinetic theory of gases. |
| 2. Apply inorganic chemistry concepts | 2.1 Elements are identified and classified as per the periodic table. 2.2 Chemical bonds are determined as per Valence Shell Electron Pair Repulsion (VSEPR) theory. 2.3 Inorganic salts are tested as Per solubility rules |
| 3. Apply organic chemistry concepts | 3.1 Organic compounds classes are used according to International Union of Pure and Applied Chemistry (IUPAC) rules. 3.2 Physical properties of organic compounds are applied as per IUPAC rules. 3.3 Chemical properties organic compounds are applied as per IUPAC rules. 3.4 Synthesized compounds are purified as per organic laboratory manual 3.5 Purified compounds are categorized as per organic laboratory manual |

RANGE

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

| Variable | Range |
|-----------------|--------------|
| | |

| | |
|--|--|
| 1. Cover page details includes but not limited to: | <ul style="list-style-type: none"> • Name of the Organization • Project Title • Project Time-frame • Project Contacts |
| 2. Summary includes but not limited to: | <ul style="list-style-type: none"> • Background information • Problem statement • Scope • Project Objectives • Project justification • Research questions • Project hypothesis • Significance of the study |
| 3. Methodology includes but not limited to: | <ul style="list-style-type: none"> • Project Approach Summary • Work Breakdown • Task Time Estimates • Project Deliverables • Research questions |
| 4. Cost includes but not limited to: | <ul style="list-style-type: none"> • Project Budget • Budget Narrative • Additional Financial Statements |
| 5. Plan includes but not limited to: | <ul style="list-style-type: none"> • Proposal development • Data collection • Time frame • Activity |
| 6. Processed includes but not limited to: | <ul style="list-style-type: none"> • Tabulated • Using Data processing software • Used in mathematical functions • Modelled |
| 7. Pre-processed includes but not limited to: | <ul style="list-style-type: none"> • Sorted • Cleaned |
| 8. Relevant stakeholders include but not limited to: | <ul style="list-style-type: none"> • Institution • Supervisor • Any company that helped in the research. |

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:

- Periodic table
- Hydrocarbons
- Chemical reaction
- Laboratory apparatus
- Laboratory rules and regulation

Required knowledge

The individual needs to demonstrate knowledge of:

- Observation
- Analytical
- Critical thinking
- Writing
- Active listening
- Problem-solving

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 | <p>Assessment requires evidence that the candidate:</p> <p>1.1 Applied acid and bases properties as per acid-base theory. 1.2 Applied salts properties as per salt solubility rules 1.3 Applied Ionic and chemical equilibrium properties as per physical chemistry theory. 1.4 Formed aqueous solutions based on mole concept principles. 1.5 Applied reaction kinetics properties as per physical chemistry theory. 1.6 Applied gas properties as per kinetic theory of gasses. 1.7 Tested inorganic salts as per solubility rules 1.8 Applied physical properties of organic compounds as per IUPAC rules. 1.9 Applied chemical properties of organic compounds as per IUPAC rules. 1.10 Used purified compounds as per organic laboratory manual</p> |
| 2. Resource Implications | <p>The following resources should be provided:</p> <p>2.1 Appropriately simulated environment where assessment can take place. 2.2 Access to relevant workplace. 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> <ul style="list-style-type: none"> 3.1 Observation 3.2 Oral questioning 3.3 Written test 3.4 Portfolio of Evidence 3.5 Interview 3.6 Third party report |
| 4. Context of Assessment | <p>Competency may be assessed:</p> <ul style="list-style-type: none"> 4.1 Workplace 4.2 Simulated work environment |
| 5. Guidance information for assessment | <p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p> |