# Knowledge Assessment

**Assessment event 1 of 3**

## Criteria

### Unit code, name and release number

MSL974019 - Perform chemical tests and procedures (1)

### Qualification/Course code, name and release number

MSL40118 - Certificate IV in Laboratory Techniques (1)

MSL50118 - Diploma of Laboratory Technology (1)

\*\*Amend the qualification box before distributing to the student. The information here should only contain the qualification the student is enrolled in.\*\*

## Student details

### Student number

### Student name

## Assessment Declaration

* This assessment is my original work and no part of it has been copied from any other source except where due acknowledgement is made.
* No part of this assessment has been written for me by any other person except where such collaboration has been authorised by the assessor concerned.
* I understand that plagiarism is the presentation of the work, idea or creation of another person as though it is my own. Plagiarism occurs when the origin of the material used is not appropriately cited. No part of this assessment is plagiarised.

### Student signature and Date

Version: 1.0

Date created: 07/06/2019

Date modified: 19/11/2019

For queries, please contact:

Innovative Manufacturing, Robotics and Science SkillsPoint

Hamilton Campus

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## Assessment instructions

Table 1 Assessment instructions

| Assessment details | Instructions |
| --- | --- |
| **Assessment overview** | The objective of this assessment is to assess your knowledge as would be required to interpret chemical test requirements. |
| **Assessment Event number** | 1 of 3 |
| **Instructions for this assessment** | This is a written assessment. You will be assessed on your knowledge of the unit. You will be permitted one A4 double sided sheet of personal study notes to take into the assessment. There is an Appendix containing a periodic table and a Valency table attached to the end of the assessment paper. You are permitted to remove the this from the document to use in the assessment  This assessment is in four sections:   1. Multiple choice questions (Questions 1 to 5) 2. True or False questions (Questions 6 to 17) 3. Short answer questions (Questions 18 to 29) 4. Assessment feedback. |
| **Submission instructions** | On completion of this assessment, you are required to hand it to your trainer for marking. You are to hand in the periodic table and the Valency table with your assessment.  It is important that you keep a copy of all electronic and hardcopy assessments submitted to TAFE and complete the assessment declaration when submitting the assessment. |
| **What do I need to do to achieve a satisfactory result?** | To achieve a satisfactory result for this assessment all questions must be answered correctly. |
| **What do I need to provide?** | Calculator, pens, A4double sided sheet of personal study notes |
| **Due date/time allowed** | 2 hours |
| **Assessment feedback, review or appeals** | Appeals are addressed in accordance with Every Student’s Guide to Assessment. |

## Multiple choice (Questions 1 - 5)

Read the question and each answer carefully. Put an X in the table next to your chosen answer.

1. Both Ionic and covalent bonds are found in the following compounds

Table 2 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Hydrogen sulfide |  |
| 1. Methanoic acid |  |
| 1. Potassium fluoride |  |
| 1. Sodium hydroxide |  |

1. Chemical tests can be performed to:

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Determine the composition of material |  |
| 1. Determine pollutants in a waterway |  |
| 1. Identify contaminants in a pharmaceutical product |  |
| 1. All of the above |  |

1. As you go across the Periodic Table, the trend in bond types between fluorine and the elements of Row 2 is:

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Ionic 🡪 dispersion |  |
| 1. Ionic 🡪 covalent |  |
| 1. Metallic 🡪 covalent |  |
| 1. Metallic 🡪 ionic |  |

1. Nitric acid (HNO3(aq)) is a strong acid. In a 0.01M solution the concentration of H+(aq) is:

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. 2 mol L-1 |  |
| 1. 1 x 10-12  mol L-1 |  |
| 1. 0.01 mol L-1 |  |
| 1. 1 x 10-14 mol L-1 |  |

1. Which of the following indicates a chemical reaction has occurred?

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. A large change in temperature |  |
| 1. A change in colour |  |
| 1. A gas given off |  |
| 1. A precipitate formed |  |
| 1. All of the above |  |

## True or false (Question 6 – 17)

Read the question and then write **True** or **False** in the space provided.

| Question | Write *True* or *False* |
| --- | --- |
| 1. An example of an intermolecular bond is dipole-dipole bonding |  |
| 1. Fe2+ is an anion |  |
| 1. The Periodic Table predicts the order of elements using their Atomic Mass |  |
| 1. A weak acid is one that does not completely ionise in water |  |
| 1. The colour visible when a firecracker explodes is due to the emission of absorbed energy as light |  |
| 1. Emission spectra can be used to identify elements |  |
| 1. The boiling of water is a chemical reaction |  |
| 1. 500 mL of 1 M solution of C6H12O6 contains 90.078 g of C6H12O6 |  |
| 1. The SI unit for mass is the kilogram |  |
| 1. A sample sent for analysis should be representative of the bulk material. |  |
| 1. The molecular weight for molecule of ethanol (C2H5OH) is 9 au |  |
| 1. 15.0 mL of a 1000mg/L stock solution is diluted to 200 mL The concentration of the diluted solution is 75 mg/L |  |

## Short answer (18 - 29)

Read the question carefully. Your answer should be a minimum of 5 words but no longer than 100 words for questions requiring a response other than a formula, calculation or equation.

1. Complete the table by providing the correct formula or name for the chemicals identified.

|  |  |  |  |
| --- | --- | --- | --- |
| Chemical | Formula | Formula | Chemical |
| Iron II sulfate |  | CO |  |
| Potassium oxide |  | N2O4 |  |
| ammonia |  | PbO2 |  |
| Diphosphorous pentoxide |  | KMnO4 |  |

1. Explain the following terms using an example in your response

**Element:**

**Compound:**

**Ion:**

**Atom:**

**Molecule:**

1. Explain how the position of an element in the Periodic Table assists in predicting characteristics of another element. Provide an example in your response.
2. The Haber process to produce ammonia involves the reaction of hydrogen and nitrogen gas. This an equilibrium reaction. Complete the following:
3. Write the chemical equation for the reaction
4. Write the equilibrium expression for the reaction
5. Explain the use of a catalyst in the commercial production of ammonia
6. Write the balanced neutralisation equation for the reaction of methanoic acid (HCOOH) and barium hydroxide (Ba(OH)2).

**The following questions relate to practices in your laboratory/simulated laboratory.**

1. Metrology is the study of measurement. The function of a laboratory is to measure something and report a result. How are the following relevant to your laboratory?
2. sources of error:
3. uncertainty:
4. precision:
5. repeatability:
6. accuracy:
7. significant figures:
8. all measurements being only estimates:
9. In a laboratory where would you find information regarding any hazard related to a particular sample or test method?
10. How do you ensure you are following the correct method for the testing of a sample?
11. If atypical results are evident for a particular sample, what trouble-shooting procedures are in place? (You should consider calibration, equipment functionality and the actual procedure being followed.)
12. In a laboratory what systems are in place to ensure the traceability of samples at all points of the process, from sampling to testing through to reporting?
13. How is confidentiality and physical security of data managed in the laboratory?
14. The generation of waste and the impacts to the environment must be considered for all laboratory testing. How can these be minimised in the laboratory?

## Assessment Feedback

*NOTE: This section* ***must*** *have the assessor signature and student signature to complete the feedback.*

### Assessment outcome

Satisfactory

Unsatisfactory

### Assessor Feedback

Was the assessment event successfully completed?

If no, was the resubmission/re-assessment successfully completed?

Was reasonable adjustment in place for this assessment event?  
*If yes, ensure it is detailed on the assessment document.*

Comments:

### Assessor name, signature and date:

### Student acknowledgement of assessment outcome

Would you like to make any comments about this assessment?

### Student name, signature and date

***NOTE: Make sure you have written your name at the bottom of each page of your submission before attaching the cover sheet and submitting to your assessor for marking.***

**Valency Table**

***Common ions and their charges***

| +1 | +2 | +3 | +4 | -1 | -2 | -3 |
| --- | --- | --- | --- | --- | --- | --- |
| ammonium  NH4+ | barium  Ba2+ | aluminium  Al3+ | Lead (IV)  Pb4+ | acetate (ethanonate)  CH3COO - | carbonate  CO32- | phosphate  PO43- |
| potassium  K+ | calcium  Ca2+ | iron (III)  Fe3+ | tin (IV)  Sn4+ | bromide  Br - | chromate  CrO42- | phosphide  P3- |
| silver  Ag+ | Copper (II)  Cu2+ |  |  | chlorate  ClO3 - | dichromate  Cr2O72- | nitride  N3- |
| sodium  Na+ | iron (II)  Fe2+ |  |  | chloride  Cl - | oxide  O2- |  |
| Hydrogen  H+ | lead (II)  Pb2+ |  |  | fluoride  F - | peroxide  O22- |  |
|  | magnesium  Mg2+ |  |  | hydrogen carbonate HCO3- | sulfate  SO42- |  |
|  | mercury(II)  Hg2+ |  |  | hydrogen sulfate  HSO4 - | sulfite  SO32- |  |
|  | nickel  Ni2+ |  |  | hydroxide  OH - | sulfide  S2- |  |
|  | tin (II)  Sn2+ |  |  | iodide  I - |  |  |
|  |  |  |  | nitrate  NO3 - |  |  |
|  |  |  |  | nitrite  NO2 - |  |  |
|  |  |  |  | permanganate  MnO4- |  |  |

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