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# VCE Chemistry ½

## Metal Reactions & Recycling [1.4]

## Test

20 Marks. 1 Minute Reading. 16 Minutes Writing.

**Results:**

| | |
|---|---|
| Test Questions | _____ / 15 |
| Extension | _____ / 5 |

## Section A: Test Questions (15 Marks)

**Question 1** (3 marks)

Tick whether the following statements are true or false:

| | True | False |
|---|---|---|
| **a.** An aqueous solution refers to one in which a solute has been dissolved in water. | | |
| **b.** When a metal oxide forms, the entire metal loses its shine including the outside of the metal and the inside of the metal. | | |
| **c.** Francium is the most reactive metal due to it having the lowest first ionisation energy. | | |
| **d.** Metals with a high electronegativity are more likely to be used for jewellery, due to their low reactivity. | | |
| **e.** When a group one metal reacts with water, no visible reaction will take place. | | |
| **f.** A circular economy promotes more reuse and transformation than a linear economy, which typically has more waste. | | |

Space for Personal Notes

**Question 2** (9 marks)

Adhvika takes a sample of magnesium, previously stored in oil, and places it on a table. After wiping the oil away, she notices that the magnesium has a characteristic metallic shine to it. However, after looking back at it a few minutes later, she notices the metal is now dull in colour, with little lustre.

**a.** Explain why the magnesium chunk was previously lustrous, but now lacks that lustre. (3 marks)

_____

_____

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**b.** Provide the equation for the reaction taking place. (1 mark)

_____

**c.** Curious by her observations, Adhvika places the magnesium chunk into water, in hopes of restoring the shine on the metal. However, when she does this, she instead experiences a fiery explosion.

**i.** Provide the equation for the reaction occurring. (1 mark)

_____

**ii.** Explain why a fiery explosion occurs in this reaction. (2 marks)

_____

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**d.** How instead would Adhvika be able to restore the shine of her magnesium chunk? (2 marks)

_____

_____

_____

**Question 3** (3 marks)

Chemists across the world are looking for ways to move from a circular economy towards a linear economy. As part of this process, many chemists are looking into the ways in which the metals inside of electronics such as phones can be recycled, however there has been little progress. What is the difference between the two aforementioned economies, and why is there difficulty with recycling metals in electronics?

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## Section B: Extension (5 Marks)

**Question 4** (5 marks)

Neer, known for reacting to a range of different chemicals and reporting his observations, takes some time out of his day to react to some group 1 and 2 metals with water. Neer considers a reaction between both calcium and water and caesium and water.

**a.** Which of the following chemicals will react more vigorously with the water and why? (2 marks)

_____

_____

_____

**b.** Provide the formula for the reaction between calcium and water. (1 mark)

_____

**c.** Why does dull calcium not react rapidly with water, whereas lustrous calcium has a strong and violent reaction with water? (2 marks)

_____

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