



## EXERCISE 3.3

MODULE 3 TOPIC 2, p. 127  
Gr 10 Physical Sciences 3-in-1

## QUESTION 1

Thabo burns a piece of magnesium ribbon with a mass of 1 gram in oxygen. The magnesium burns with a bright white light. He weighs the final product and finds the mass is 1,67 grams.

1.1 Classify this chemical reaction as a:

1.1.1 *synthesis* or *decomposition* reaction

1.1.2 *exothermic* or *endothermic* reaction

1.2 Give a reason for your answer in:

1.2.1 QUESTION 1.1.1

1.2.2 QUESTION 1.1.2

1.3 Write a balanced chemical equation for this reaction.

## QUESTION 2

2.1 State what each of the following symbols mean.

2.1.1 (s)

2.1.2 (l)

2.1.3 (aq)

2.1.4 (g)

2.2 Write a balanced chemical equation for each of the reactions **A** to **E**. Include symbols (from QUESTION 2.1) where applicable.

reaction **A**: lithium + oxygen → lithium oxide

reaction **B**: sulphur + oxygen gas → sulphur dioxide gas

reaction **C**: sodium nitrate → sodium nitrite + oxygen gas

reaction **D**: hydrogen chloride gas → hydrogen gas + chlorine gas

reaction **E**: potassium + water → potassium hydroxide + hydrogen gas

2.3 Give only the LETTER(S) (**A** to **E**) of the reaction(s) in QUESTION 2.2 that may be classified as a:

2.3.1 synthesis reaction(s)

2.3.2 decomposition reaction(s)

2.4 Distinguish between an exothermic and an endothermic reaction.

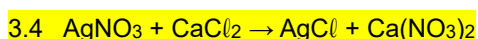
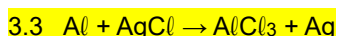
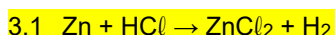
2.5 Give only the LETTER(S) (**A** to **E**) of the reaction(s) in QUESTION 2.2 that may be classified as a:

2.5.1 exothermic reaction(s)

2.5.2 endothermic reaction(s)

## QUESTION 3

Rewrite and balance the following chemical equations.



## EXERCISE ANSWERS

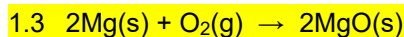
### QUESTION 1

1.1.1 synthesis

1.1.2 exothermic

1.2.1 The mass of the product is larger than that of the piece of magnesium ribbon. Therefore the magnesium must have combined with the oxygen during the reaction.

1.2.2 Energy is released during the reaction in the form of heat and light.



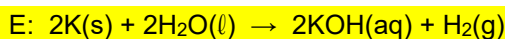
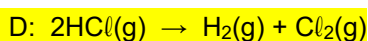
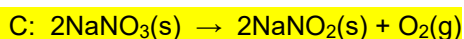
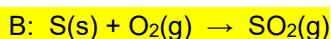
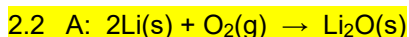
### QUESTION 2

2.1.1 solid

2.1.2 liquid

2.1.3 aqueous solution

2.1.4 gas



2.3.1 A, B and E

2.3.2 C and D

2.4 During an exothermic reaction energy is released to the environment and the reaction mixture has an increase in temperature.

During an endothermic reaction energy is absorbed from the environment and the reaction mixture has a decrease in temperature.

2.5.1 A, B and E

2.5.2 C and D

### QUESTION 3

