9Fa TYPES OF EXPLOSION

1 Tick (✓) *one* correct statement for each of the following.

a When a physical change occurs:

- ☐ **A** no new substances are made and there is no change in mass.
- ☐ **B** new substances are made and there is a change in mass.
- ☐ **C** no new substances are made but there is a change in mass.
- ☐ **D** new substances are made and there is no change in mass.

b When a chemical change occurs:

- ☐ **A** no new substances are made and there is no change in mass.
- ☐ **B** new substances are made and there is a change in mass.
- ☐ **C** no new substances made but there is a change in mass.
- ☐ **D** new substances are made and there is no change in mass.

2 Describe what happens to bonds in a chemical reaction.

SB **3** Write word and symbol equations for the combustion of one atom of carbon.

4 A student drops a mint sweet into a bottle of diet cola. Foamy liquid shoots out of the bottle. This is the change that occurs: $CO_2(aq) \rightarrow CO_2(g)$

a What does the state symbol (g) mean? _____

b Explain whether this is a physical change or chemical reaction.

c Use the particle model to explain the pressure in the bottle just after the sweet is dropped in. To answer this, tick (✓) *one* box for each of parts **i** and **ii** below.

i The pressure inside the bottle:

- ☐ **A** sucks air into the bottle.
- ☐ **B** stays the same.
- ☐ **C** decreases.
- ☐ **D** increases.

ii This is because:

- ☐ **A** there are more gas molecules to hit the walls of the bottle.
- ☐ **B** there are more gas molecules to hit one another.
- ☐ **C** the walls of the bottle hit the molecules with an equal and opposite reaction.
- ☐ **D** a vacuum is created, which must be filled.

5 In your group, look at your answer to question **3** on page **51**. Discuss your ideas again to find out if they have changed. If you can, write a better answer in the lower box on that page.

9F.D REACTIVITY

1 What is the 'reactivity series'?

_____

2a Use the table to help identify the metals below.

Metal X can catch fire in air, reacts with cold water and reacts quickly with dilute acid. Metal X is likely to be

_____.

Metal Y reacts quickly with dilute acid and the oxygen in air but reacts very slowly with water. Metal Y is likely to be

_____.

Metal Z catches fire in air, is explosive with dilute acid and reacts very quickly with water. Metal Z is likely to be

_____.

Metal	Reaction with oxygen in air	Reaction with cold water	Reaction with dilute acid
potassium	🔥	🔥	💥
sodium	🔥	✓✓✓	💥
lithium	🔥	✓✓	✓✓✓
calcium	🔥	✓✓	✓✓✓
magnesium	🔥	✓	✓✓
aluminium	✓✓✓	•••	✓✓
zinc	✓✓	•••	✓✓
iron	✓✓	•••	✓
tin	✓	•••	✓
lead	✓	•••	✓
copper	✓	✗	✗
mercury	•••	✗	✗

Increasing reactivity

Key

💥 explosive	🔥 can catch fire	✓✓✓ reacts very quickly
✓✓ reacts quickly	✓ reacts	••• slow or partial reaction
✗ no reaction		

b Describe the trend in reactivity of the metals in group 1 of the periodic table as you go down the group. Use the periodic table on page 113 to help you.

_____

3 Complete the following equations.

potassium + water → _____ + _____

_____ + hydrochloric acid → calcium chloride + _____

_____ + _____ → magnesium oxide

lithium + nitric acid → _____ + _____

sodium + _____ → sodium hydroxide + _____

$Mg + H_2SO_4 \rightarrow$ _____ + _____