OCR
Oxford Cambridge and RSA

GCSE Chemistry A (Gateway Science)

J248/04 Chemistry A C4-C6 and C7 (Higher Tier)

Question Set 28

1 Iron rusts when it gets wet.

(a) The word equation for rusting is

iron + water + oxygen → rust (hydrated iron(III) oxide)

Balance the symbol equation for the formation of rust.

..4...Fe(s) + ..6...H_2O(l) + ..3...O_2(g) → ..2..$Fe_2O_3 \cdot 3H_2O$(s)

[2]

(b) A 1.0 kg iron bar is left outside in the rain.

- All of the iron turns to rust.
- The rust forms at a rate of 60 g per day.

Calculate how long it will take for the iron bar to turn completely to rust.

Give your answer to the nearest day.

$n_{Fe} = \frac{m}{mr} = \frac{1000}{56} = 17.9$ mol

$\Rightarrow n_{rust} = \frac{17.9}{2} = 8.93$ mol

$m_{rust} = n \times mr = 8.93 \times 214 = 1911.02$

$\text{rate} = \frac{\text{total mass}}{\text{time taken}} \Rightarrow \text{time taken} = \frac{\text{total mass}}{\text{rate}}$

$= \frac{1911.02}{60}$

$= 31.9$ days

Answer = ... 32 ..... days **[6]**

Total Marks for Question Set 28: 8