



ST ANDREW'S SECONDARY SCHOOL

NAME

TEACHING
GROUP

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DATE

DD	MM	YYYY
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CHEMISTRY



Answering Templates : DESCRIBE [D] / EXPLAIN [E]

Reactions of Metals

1 Reactivity Series of Metals

[D] Reaction with cold water (only for K, Na & Ca)

For Group I metals:

- **Metal** reacts explosively (K) / readily (Na) with cold water, where it ignites and darts around at high speeds on the surface of the water.
- Effervescence is observed, producing a colourless gas that extinguishes a lighted splint with a 'pop' sound.

For non-Group I metals:

- **Metal** reacts very slowly (Ca) with cold water.
- Effervescence is observed, producing a colourless gas that extinguishes a lighted splint with a 'pop' sound.

[D] Reaction with steam (only for Ca, Mg, Al, Zn & Fe)

- **Metal** reacts violently (Ca) / readily (Mg) / slowly (Zn / Fe) with steam.
- A *coloured* solid (**metal oxide**) is formed.

[D] Reaction with dilute acids (only for Ca, Mg, Al, Zn & Fe)

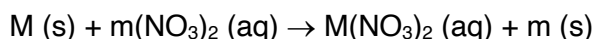
- **Metal** reacts explosively (Ca) / violently (Mg) / readily (Zn) / quickly (Fe) with dilute acid.
- Effervescence is observed, producing a colourless gas that extinguishes a lighted splint with a 'pop' sound.

[E] Why aluminium, despite its high reactivity, does not react with steam or dilute acids?

- ⇒ Aluminium reacts readily with oxygen in air to form aluminium oxide that covers the metal surface.
- ⇒ This oxide layer prevents / protects aluminium from reacting with steam/ **dilute acids**.

Displacement reactions

In general,



$M > m$
Comparing reactivity

[D]

- A *coloured* solid (**more reactive metal**) is deposited.
- Colour of the **solution** changes to *another colour* / decolourises.

[E]

- ⇒ The (**more reactive metal**) is more reactive than (**less reactive metal**).
- ⇒ Thus, the (**more reactive metal**) displaces the (**less reactive metal**) from its (**salt solution of less reactive metal**).

Key

Terms in template

Highlighted

Italic

Replace with

chemical name

colour observed

2 Colours of selected metal compounds

Metal ion	Colour of salt solution	Colour of oxide
Cu^{2+}	Blue	Black
Fe^{2+}	Pale green	Black
Fe^{3+}	Yellow	Red-brown
Zn^{2+}	Colourless	White

Most metals are silver / grey in colour, except Cu (pink-brown) & Au (gold).