# Chemistry C2.3 Metals and Acids

## Section 1: Acids and metals

| | | |
|---|---|---|
| 1 | **Observations with metal and acid reactions** | Magnesium: Bubbles vigorously<br>Zinc/ iron: Bubbles steadily<br>Lead: Few bubbles |
| 2 | **Products** | A salt and hydrogen |
| 3 | **Test for hydrogen** | Put a lit splint in the gas and there will be a squeaky pop |

## Section 2: Metals and oxygen

| State symbols | | |
|---|---|---|
| 4 | **(s)** | Solid |
| 5 | **(l)** | Liquid |
| 6 | **(g)** | Gas |
| 7 | **(aq)** | Solution |

| Reactions with oxygen | | |
|---|---|---|
| 8 | **magnesium** | Burns vigorously |
| 9 | **Zinc** | Burns less vigorously |
| 10 | **Iron** | Burns |
| 11 | **lead** | Does not burn |
| 12 | **Copper** | |
| 13 | **Gold** | No reaction |

**reactive**
potassium
sodium
lithium
calcium
magnesium
aluminium
zinc
iron
lead
copper
silver
gold
**unreactive**

## Section 3: Metals and water

| | | |
|---|---|---|
| 14 | **Reactivity series** | A list of metals in order of how vigorously they react |
| 15 | Metals at the top of the reactivity series have very vigorous reactions. Going down the list, the metals get less reactive | |

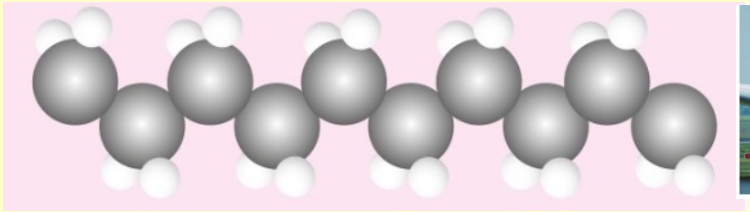
## Section 4: Metal displacement reactions

| | | |
|---|---|---|
| 16 | **Displace** | A more reactive metal displaces – or pushes out – a less reactive metal from its compound |
| 17 | **Displacement** | In a displacement reaction, a more reactive metal displaces a less reactive metal from its compound |
| 18 | **Thermite reaction** | Aluminium + iron oxide → aluminium oxide + iron |

## Section 5: Extracting metals

| | | |
|---|---|---|
| 19 | **Ore** | A rock that you can extract a metal from |
| 20 | **How metals are extracted from their ore** | 1. Separate the metal oxide from its ore<br>2. Use chemical reactions to extract the metal from its metal oxide |
| 21 | **Chemical reactions** | The chemical reactions involve heating the metal oxide with charcoal (carbon).<br>Any metal that is below carbon in the reactivity series can be displaced from its compounds by carbon |

magnesium
aluminium
carbon
zinc
iron
lead
copper



## Section 6: Materials

| | Material | Description | Properties | Uses |
|---|---|---|---|---|
| 22 | **Ceramics** | A compound such a metal silicate or oxide that is hard, strong and has a high melting point | • Hard<br>• Brittle<br>• Stiff<br>• Solid at room temperature<br>• Strong<br>• Break easily<br>• Electrical insulators | • Bricks – are strong which makes them suitable for buildings<br>• Electrical power-line insulators – ceramics do not conduct electricity |
| 23 | **Polymers** | A substance made up of very long molecules | • Does not conduct electricity<br>• Poor conductors of heat | • Carrier bags (low-density polyethene)<br>• Artificial joints (high-density polyethene) |
| 24 | **Composites** | A mixture of materials with properties that are a combination of those of the materials in it | Has properties that are a combination of the properties of the materials it is made up of | • Carbon-fibre-reinforced plastic<br>• Glass-fibre-reinforced aluminium |