Cambridge IGCSE Chemistry

Topic 10: Metals

Uses of metals

Notes

Name the uses of aluminium…

- In the manufacture of aircraft because of its strength and low density
- In food containers because of its resistance to corrosion

(Extended only) Explain the uses of zinc for galvanising and for making brass

- Galvanising
  - Zinc can be sacrificed to keep steel from rusting (galvanising)
  - Galvanise = to coat (iron or steel) with a protective layer of zinc
  - Zinc is oxidised instead of the iron/steel
- Brass
  - Zinc is alloyed with copper to make brass

Name the uses of copper related to its properties (electrical wiring and in cooking utensils)

- Copper is soft, easily bent, good conductor of electricity
- Therefore, it is used in electrical wiring and in cooking utensils (i.e. pans)

Name the uses of mild steel (car bodies and machinery) and stainless steel (chemical plant and cutlery)

- Mild steel – tough, ductile, malleable, good tensile strength – car bodies & machinery
- Stainless steel (chromium & iron alloy) – resistant to corrosion – chemical plant & cutlery

(Extended only) Describe the idea of changing the properties of iron by the controlled use of additives to form steel alloys

- There are many different types of steel, depending on the other elements mixed with the iron
- E.g. chromium & nickel are mixed to make stainless steel, which is resistant to corrosion
- And mild steel has about 0.25% carbon, which is therefore easily shaped
- And high carbon steel has about 2.5% carbon, which is therefore hard (compare this to low carbon steel, which is easily shaped)
- Therefore, depending on the elements used in addition to iron to form steel alloys, the properties will be different meaning different uses
- Alloys will be harder than pure iron because the different sized metal ions (from other metals) disrupt the regular arrangement of layers of ions, preventing them sliding over each other as easily. The more different sized metal ions added to iron, the harder the alloy will be.