

UNIT 6. METALS

6.1.- Metals.

Metals are raw materials, we obtain them from minerals.

6.1.1.- Properties of metals: (page 124)

- Most metals are hard, tough and resistant.
- They are ductile and malleable.
- Some metals are elastic, but others are plastic.
- They are good conductors of electricity, heat and sound.
- Iron, steel and nickel are magnetic materials.
- They expand with temperature.
- They react with oxygen in water and air and they get rusted, like steel.
- Metals are recyclable and reusable, but some of them are toxic.



6.1.2.- Classifying metals.

We use pure metals, like copper or aluminum, or **alloys** (aleación). An **alloy** is a mixture of a metal and another chemical element. Steel, bronze or brass (latón) are alloys.

Depending on their origin, metals can be classified as **ferrous** and **non-ferrous**.

6.1.3.- Ferrous Metals. (page 125)

Ferrous metals contain iron, like pure iron, cast iron (fundición) and steel.

- Pure iron is used for magnets and antennas in electronic devices.
- Cast iron (with 2 to 6% of carbon) is used for machinery parts, like pistons, bench vices, or street lamps.



- Steel: (page 126), it is the most used metal. It contains a small quantity of carbon, less than 2%. It is hard, strong, tough and resistant, ductile and malleable, good conductor of electricity and heat, it is magnetic and can be welded without difficulty.

The disadvantage of steel is that it corrodes easily. To avoid this we cover it with special paint called minium (minio). Stainless steel has chrome in its composition.



6.1.4.- Non Ferrous Metals. (page 127)

They do not contain iron. The most used are aluminum, copper, tin (estaño), brass and lead (plomo).

- Aluminum: it is very light, strong, ductile and malleable, good conductor of heat and electricity and resistant to corrosion. It is used for aircrafts, power lines, cans, bicycles, pans, window frames, ladders, etc.



- Copper: red shiny, ductile and malleable, good conductor of heat and electricity. When it corrodes, it turns into green appearance that protects it from corrosion. It is used for wires, pipes, radiators, chemical industry and decoration.



- Tin: it is malleable, soft and does not rust. It is used for making bronze, and it covers steel to avoid corrosion in pipes and cans (hojalata).
- Brass: it is an alloy of copper and zinc. Resistant to corrosion, good conductor of electricity and with a gold shiny appearance. It is used for plumbing, electrical contacts, door and drawer handles and jewelry.



- Lead: it is soft and malleable, resistant to corrosion but it is toxic. It was used for pipes, but now it is forbidden. Now we use it for batteries and protective measure against nuclear radiation.

