Aluminium Extraction: Introduction

Aluminium, Al, is a silvery metal of relatively low density: 2.7 g/cm^3. It is a reactive metal but it appears to be unreactive. This is because on exposure to air all aluminium becomes coated with a layer of unreactive aluminium oxide which protects it. If this layer is removed, aluminium burns quite spectacularly in air. This was seen to disastrous effect during the Falklands war, when ships made from aluminium burned fiercely.

You will see aluminium and its alloys everywhere, from window frames, garage doors, lightweight bicycle frames and aeroplane bodies to cooking foil, saucepans and drink cans. A magnet will attract a steel can but not an aluminium one.

Some background

The Hall-Héroult process was discovered by Charles Hall in the USA and Paul-Héroult in France in 1886. These two inventors worked quite independently but came up with the same process in the same week of the same year! Even stranger, the two were born in the same year and died at the same age.

Before this process was developed, aluminium was extremely expensive because it was so difficult to extract. The French emperor Napoleon III had the state dinner service made from aluminium. Less favoured guests were given gold plates.

Did you know?

About 60% of aluminium is recycled.

Recycled aluminium requires 5% of the energy needed for primary aluminium.

Aluminium produced by this process is about 99.7% pure.

Aluminium is the most common metal in the earth's crust.

Bauxite ore is named from Les Baux in France.