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ALMUNIUUM

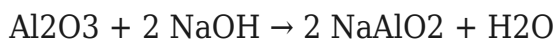
Aluminium is a chemical element in the boron group with symbol Al and atomic number 13. It is a silvery-white, soft, nonmagnetic, ductile metal. By mass, aluminium makes up about 8% of the Earth's crust; it is the third most abundant element after oxygen and silicon and the most abundant metal in the crust, though it is less common in the mantle below.

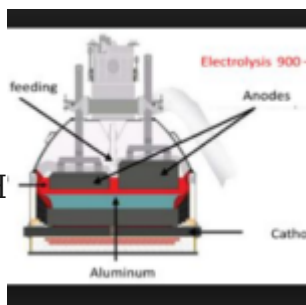
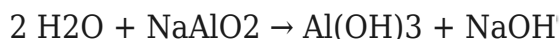
Aluminium is remarkable for the metal's low density and its ability to resist corrosion. Aluminium and its alloys are vital to the aerospace industry and important in transportation and structures, such as building facades and window frames.

PRODUCTION:

BAYER AND HALL-HEROULT PROCESS

Bauxite is converted to aluminium oxide (Al₂O₃) by the Bayer process. Relevant chemical equations are:





The intermediate, sodium aluminate, with the simplified formula NaAlO_2 , is soluble in strongly alkaline water, and the other components of the ore are not. Depending on the quality of the bauxite ore, twice as much waste (“Bauxite tailings”) as alumina is generated.

The conversion of alumina to aluminium metal is achieved by the Hall-Héroult process. In this energy-intensive process, a solution of alumina in a molten (950 and 980 °C (1,740 and 1,800 °F)) mixture of cryolite (Na_3AlF_6) with calcium fluoride is electrolyzed to produce metallic aluminium:



The Hall-Heroult process produces aluminium with a purity of above 99%.

PRC, Russia and Canada are the largest producer of aluminium in the world. Australia is the largest producer of bauxite.

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