Lanthanum Encyclopedia Article

Lanthanum

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Lanthanum

Lanthanum is a rare-earth element denoted by the atomic symbol La. Its atomic number is 57, and its atomic weight is 138.9055. Its melting point is 1,688°F (920°C) and boiling point, 6,251°F (3,455°C). The element occurs in high concentrations in rare earth ores like monazite (25 percent) and bastnasite (38 percent). Lanthanum is a soft, silvery-white metal that can be cut with a knife.

The last quarter of the nineteenth century saw an intriguing treasure hunt in northern Europe as chemists sought to separate, extract, and identify the more than a dozen chemical substances known as the rare earth elements. A key discovery in this hunt was made in 1839 by the Swedish chemist and mineralogist Carl Gustav Mosander. Mosander was working with ceria, one of the two major fractions of a very complex rare-earth mineral known as ytterite. Mosander found that by heating ceria and treating the product with nitric acid, he could produce an entirely new substance. He gave the name *lanthana*, meaning "hidden," to the substance. The name of the element was later changed to *lanthanum* to conform with those of other elements.

The element itself was not prepared in pure form until 1923, when it was produced by the electrolysis of its fused chloride. Now, it typically produced by using ion exchange and solvent extraction techniques.

Lanthanum (III) chloride is one component of misch metal, an alloy that produces sparks when scratched. Misch metal is used in cigarette lighters. Lanthanum compounds impart special optical qualities to glass so they are used in the manufacture of certain specialized lenses. Lanthanum (III) fluoride and lanthanum (III) oxide are used in the manufacture of electrodes for carbon arc lamps, especially those used in the motion picture industry. Lanthanum (III) nitrate and lanthanum ammonium nitrate are strong oxidizing agents and have been used as rocket fuels. Lanthanum has also been incorporated into ladder structured electrodes and used to produce high temperature superconductors.