Erbium Encyclopedia Article

Erbium

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Erbium

Erbium is a lanthanide series, rare-earth element characterized by the atomic symbol Er. It has an atomic number of 68 and an atomic weight of 167.26. It is a soft, malleable solid with a bright, silvery luster. Its melting point is 2,784.2°F (1,529°C), its boiling point, 5,194.4°F (2,868°C). Its salts are pink or rose. The element is prepared today by the electrolysis of the fused chloride, by the reaction of calcium with erbium (III) fluoride, or by ion -exchange methods.

The history of the rare earth elements is at least as complex as their chemistry. Between 1839 and 1848, Carl Gustav Mosander attempted to unravel the mineral known as ytterite, first found in 1787 by Carl Axel Arrhenius. The task was very difficult because the parts of which ytterite was composed were all very chemically similar. Clever techniques had to be devised to distinguish one component from another.

In 1843, Mosander showed that one portion of ytterite (the name, by then, had been changed to gadolinite) was composed of three different "earths," or oxides. He named them yttria, erbia, and terbia. All these names were derived from the Swedish town near which ytterite had originally been found, Ytterby. Through a peculiar accident of history, the names erbia and terbia became interchanged. Thus, when Mosander finally isolated the new element he named *erbium* in 1843, it was from the fraction he had originally called terbia.

Although Mosander deserves credit for discovering erbium, a pure sample of its oxide was not actually prepared until 1905 by G. Urbain (1872-1938) and C. James (1880-1928). The pure metal itself was finally obtained in 1934 by Klemm and Bommer by treating erbium (III) chloride with potassium vapors.

The pink color of erbium compounds makes them desirable as tinting agents. Erbium (III) oxide, for example, has been used to impart a pink shade to glass and porcelain. Erbium has also found limited application in the nuclear power industry and in metallurgy. The addition of erbium to vanadium, for example, softens the latter metal and makes it more workable.