Lawrencium Encyclopedia Article

Lawrencium

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Lawrencium

Lawrencium is an actinide series element denoted by the chemical symbol Lr. Its atomic number is 103 and the average atomic weight of its isotopes is 262. It is a manmade radioactive element that has no stable nuclides. Since only a small amount of this element has ever been produced at one time, its chemical properties are largely unknown.

The discovery of lawrencium was a result of a concerted effort by scientists to produce a new element. By using a method in which they bombarded californium with boron nuclei, they were able to produce element 103. They knew in advance that no more than a few atoms of the new element would result from this procedure.

The method they developed for capturing and studying these atoms included a thin strip of copper that acted as a conveyor belt. Atoms of the new element produced in the californium-boron reaction were captured on the copper conveyor belt and carried past a set of solid-state detectors. The detectors examined the tracks left as the new element decayed, matching those tracks with ones predicted for the element.

The experiment succeeded and, in 1961, Albert Ghiorso, T. Sikkeland, A. D. Larsh, and R. M. Latimer claimed discovery of element 103. They suggested the name *lawrencium* for the element, in honor of Ernest O. Lawrence (1901-1958), inventor of the cyclotron. The isotope discovered by the Ghiorso team, lawrencium-258, has a half life of 4.2 seconds. The longest-lived isotope of the element is lawrencium-260, with a half life of about 3 minutes.

Some fundamental properties of the element have been determined by carrying out analyses that take no more than 30 seconds and that can involve no more than a single atom of the element. These data suggest that it behaves like elements earlier in the actinide series.