

Livermore and Russian scientists propose new names for elements 114 and 116

December 1 2011

The International Union of Pure and Applied Chemistry (IUPAC) today recommended new proposed names for elements 114 and 116, the latest heavy elements to be added to the periodic table.

Scientists of the Lawrence Livermore National Laboratory (LLNL)-Dubna collaboration proposed the names are Flerovium for element 114 and Livermorium for element 116.

In June 2011, the IUPAC officially accepted elements 114 and 116 as the heaviest elements, more than 10 years after scientists from the Joint Institute for Nuclear Research in Dubna and Lawrence Livermore chemists discovered them.

Flerovium (atomic symbol Fl) was chosen to honor Flerov Laboratory of Nuclear Reactions, where superheavy elements, including element 114, were synthesized. Georgiy N. Flerov (1913-1990) was a renowned physicist who discovered the [spontaneous fission](#) of [uranium](#) and was a pioneer in heavy-ion physics. He is the founder of the Joint Institute for [Nuclear Research](#). In 1991, the laboratory was named after Flerov – Flerov Laboratory of Nuclear Reactions (FLNR).

Livermorium (atomic symbol Lv) was chosen to honor Lawrence Livermore National Laboratory (LLNL) and the city of Livermore, Calif. A group of researchers from the Laboratory, along with scientists at the Flerov Laboratory of Nuclear Reactions, participated in the work carried out in Dubna on the synthesis of superheavy elements, including

element 116. (Lawrencium -- Element 103 -- was already named for LLNL's founder E.O. Lawrence.)

In 1989, Flerov and Ken Hulet (1926-2010) of LLNL established collaboration between scientists at LLNL and scientists at FLNR; one of the results of this long-standing collaboration was the synthesis of elements 114 and 116.

"Proposing these names for the elements honors not only the individual contributions of scientists from these laboratories to the fields of nuclear science, heavy element research, and superheavy element research, but also the phenomenal cooperation and collaboration that has occurred between scientists at these two locations," said Bill Goldstein, associate director of LLNL's Physical and Life Sciences Directorate.

LLNL scientists Ken Moody, Dawn Shaughnessy, Jackie Kenneally and Mark Stoyer were critical members of the team along with a team of retired LLNL scientists including John Wild and Ron Loughheed. Former LLNL scientists Nancy Stoyer, Carola Gregorich, Jerry Landrum, Joshua Patin and Philip Wilk also were on the team. The research was supported by LLNL Laboratory Research and Development funds (LDRD).

Scientists at LLNL have been involved in heavy element research since the Laboratory's inception in 1952 and have been collaborators in the discovery of six elements -- 113,114,115,116,117 and 118.

Livermore also has been at the forefront of investigations into other areas related to nuclear science such as cross-section measurements, nuclear theory, radiochemical diagnostics of laser-induced reactions, separations chemistry including rapid automated aqueous separations, actinide chemistry, heavy-element target fabrication, and nuclear forensics.

The creation of elements 116 and 114 involved smashing calcium ions (with 20 protons each) into a curium target (96 protons) to create element 116. Element 116 decayed almost immediately into element 114. The scientists also created [element 114](#) separately by replacing curium with a plutonium target (94 protons).

The creation of elements 114 and 116 generate hope that the team is on its way to the "island of stability," an area of the [periodic table](#) in which new heavy elements would be stable or last long enough for applications to be found.

The new names were submitted to the IUPAC in late October and now remain in the public domain. The new names will not be official until about five months from now when the public comment period is over.

Provided by DOE/Lawrence Livermore National Laboratory

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