CHEMISTRY

No. 97 Dubbed Berkelium

The new element berkelium is the heaviest one so far found. It was separated by a combination of precipitation and ion exchange absorption methods.

➤ CREATION of a new chemical element, No. 97, heaviest so far, has been accomplished in the 60-inch University of California cyclotron. The new element has been christened berkelium, and its symbol is Bk. It will have to be added to all tables of elements appearing in text books and elsewhere.

Production of this new element, artificially, has been predicted for several years. Four years of research led up to the discovery. Atomic Energy Commission support to the University of California radiation laboratory made possible the research.

The 241 isotope of americum, element no. 95, was irradiated with helium ions, resulting in the production of an isotope of element 97 which is 244 or 243 in atomic weight. The new element is short-lived. It decays by electron capture in a 4.5 hour half-life.

The new element is of no use in weapons production, the official announcement gave assurance. This is also presumably true with the next lighter elements, 95 and 96, although plutonium, which is 94, in one variety is the material of choice for the atomic fission bomb.

Element 97 was separated by a combination of precipitation and ion exchange absorption methods, making use of anticipated properties, including oxidation states and its position in the periodic table as a member of the actinide transition series. Its distinctive chemical properties and equally distinctive decay properties constitute the primary evidence for the creation of the new element.

By naming the new element after the city of its birth, Berkeley, the discoverers, Dr. Seaborg, Dr. Stanley G. Thompson and Dr. Albert Ghiorso, have followed the tradition of element naming contained in the periodic table of elements. No. 97 is in the same place in the actinide series of the table as No. 65 in what is called the lanthanide series. No. 65 is named terbium after the Swedish city, Ytterby, where Gadolin, a great investigator of rare earths, did his work. Actually four elements are named after this city. So it is in line to christen the new chemical baby berkelium, and the symbol will be Bk, since Be is already used for beryllium, No. 4, a light metal at the other end of the chemical scale.

There is every confidence that No. 98 will also be discovered or may even have already been discovered. The building of such heavy elements of fleeting life is one of the achievements of the giant accelerators that can smack atomic particles into matter, making them stick together and thus transmute into elements never before made. Even heavier elements may be made in the future.

Nine chemical elements, five of them beyond uranium 92 and manufactured in Berkeley cyclotrons, have been discovered in the past dozen years. Besides 93, 94, 95, 96 and now 97, elements 43, 61, 85, and 87 have been discovered, largely as a by-product of the atomic research. The periodic table is now complete through No. 97.

Science News Letter, January 28, 1950

ICHTHYOLOGY

Extra-Boned Fish Due To Temperature Changes

➤ SHARP drops or rises in temperature cause trout eggs to develop into fish with extra backbone segments. Variant fish developed in this way experimentally correspond very closely to odd-boned sea trout found in regions where such heat changes could occur in nature.

These are the findings of Dr. A. Vedel Taning who is carrying out experiments on sea trout at the Marine Biological Laboratory at Charlottenlund Slot, near Copenhagen, Denmark.

Taking advantage of the fact, which he discovered in earlier work along the same line, that there is a brief moment during fish egg development when the embryo is supersensitive to heat changes, Dr. Taning subjected eggs to increases or decreases of 50 degrees Fahrenheit and higher. Eggs developing at medium temperatures were dropped way down to near freezing temperatures for about eight days, and then brought back to the original temperature. Those developing at near freezing were put in a warm environment for about 24 hours.

In both cases the young fish had extra spinal vertebrae, although the cold-treated ones had more than the heat-treated ones. The average increase was 3.2 over the 57 vertebrae of the parent fish.

Dr. Taning stresses the point that these changes are not inherited. Normally raised offspring will have the usual number of bones.

Similar variants occur at the southern boundary of the area where sea trout are found, for example in Italy. At the northern boundary, similar extra-boned trout are found.

Ordinarily the southern trout are considered to be a special species. In a preliminary announcement of his findings in the English journal NATURE (Jan. 7), Dr. Taning warns that classifiers who use bone counts to judge the species of fish should be careful to make sure that what looks like a different species is not actually just a heat-induced variant.

Science News Letter, January 28, 1950

CHEMISTRY

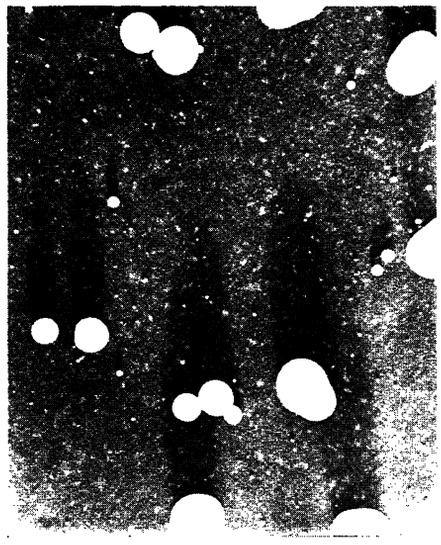
New Technique Promises More Molecule Knowledge

➤ BETTER understanding of large molecules, such as those in rubber, is promised from a technique developed in Kingsport, Tenn.

Use of an alloy of aluminum and beryllium when preparing samples to be studied in the electron microscope is said to do the trick. The method, particularly suitable for large particles, was developed by Wilbur Kaye of the Tennessee Eastman Corporation.

The alloy is used as the mounting surface for the sample that is being examined. Aluminum-beryllium is superior to the collodion or other materials commonly used for support of the specimen, it is claimed. This is because by "alloying these two light metals it is possible to reduce greatly the granularity of structure," Mr. Kaye states. He says that the alloy has advantages because of its high strength, good electrical conductivity, insolubility in nearly all solvents and low density.

Science News Letter, January 28, 1950



POLYSTYRENE PARTICLES — Polymerized rubber molecules shown against a background of aluminum-beryllium alloy illustrate a new technique of preparing specimens for electron microscope studies.