



MAKES LIGHTEST METAL

A magnetic sorting device, a special type of mass spectrograph, with which Dr. L. H. Rumbaugh of the Bartol Research Foundation has separated and concentrated the light isotope of lithium of mass six. Lithium's light isotope can be called the "lightest solid material" ever produced. The separation technique can be likened to the sifting of the wheat from the chaff by the old method of throwing it into the air and letting the wind blow the light chaff away. In Dr. Rumbaugh's apparatus the magnetic field takes the place of the wind and separates lithium of mass six from lithium of mass seven.

PHYSICS

Lightest Solid Ever Found Made at Bartol Laboratories

THE LIGHTEST solid material ever made by man or found on earth has been produced at the Franklin Institute's Bartol Research Foundation laboratories at Swarthmore, Pa.

It is a variety of lithium, lightest metal. It is lithium of atomic weight six, the lightest of the two kinds or isotopes of this element. By comparison iron of atomic weight of over 55 is extremely heavy.

This lightest solid is less than twice as heavy—atom for atom—as the gas helium used by the U. S. Government to inflate its airships.

The production of the world's lightest solid was achieved by Dr. L. H. Rumbaugh who used electro-magnetic means in the Swarthmore, Pa., laboratories. Dr. W. F. G. Swann, director of the

laboratories, gave the first hint of the achievement in a lecture before the New York Electrical Society recently. Only the merest speck of material has yet been attained but as the result of four years of research there is hope of ultimately concentrating, in usable amounts, the rare isotopic varieties of the elements.

Heavy hydrogen, or deuterium, the heavyweight isotope of common hydrogen, was the first of the chemical isotopes to be concentrated. For its identification and concentration Prof. Harold C. Urey of Columbia University recently won the Nobel prize in chemistry. The only other isotope ever concentrated in usable amounts is that of the gas neon, widely used in the red advertising signs, which was produced recently by Dr. Gustav Hertz in Germany.

Concentration of solid isotopes is much more difficult than that of gaseous elements.

Dr. Rumbaugh's Bartol apparatus ionizes lithium so that the atoms have electrical charges upon them and then shoots them into a magnetic field which acts as a sorter to spread different weight isotopes out onto a collecting strip. The magnetic field also acts as a lens to concentrate the ion beam into tiny deposits.

The "lightest" solid as a variety of lithium stands next to hydrogen and helium in the chemist's table of atomic weights. The relative weights of hydrogen, helium and lithium as determined by chemical tests are roughly as one is to four is to seven.

Actually hydrogen's atomic weight is 1.0078 and the gas is composed of hydrogen of atomic weight 1, deuterium of mass two and a trace of hydrogen of mass three, all mixed in such proportions that the average atomic weight comes out to be 1.0078.

Similarly lithium's real atomic weight is 6.940, composed of a mixture of lithium of mass six and lithium of mass seven, with the mass seven variety, of course, greatly predominating.

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PUBLIC HEALTH

Continued Good Health, More Births in U. S.

A CHECK in the thirty-year decrease in the birthrate of the United States and continued good health conditions in general throughout the country were reported to Congress by Dr. Hugh S. Cumming, Surgeon General of the U. S. Public Health Service.

About 94,000 more babies were born in the United States in the calendar year 1934 than in 1933. Later figures are not yet available. The report covers statistics of the U. S. Public Health Service only for the past fiscal year, ending June 30, 1935.

More babies were born but there was also a slight increase in deaths of infants under one year of age per 1,000 births. The infant mortality rate for 1934 was slightly higher than for 1933, but lower than for any year earlier than 1932. The death rate for the general population was also slightly higher in 1934 than 1933, the Surgeon General reported, but again was lower than any recorded rate earlier than 1932. For 1934 the death rate was 10.9 per 1,000 population.

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