of a later report. It was necessary to extend Flügge's tables to include values of $F(Z)$ and $[-F(-Z)]$ for Z up to $Z=7.0$. The new values are given in Table I.

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[1] S. Flügge, Physik. Zeits. **44**, 445–455 (1943).

Radioactive Xenon 125, and Xenon 127

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XENON 125: Cyclotron bombardments by alpha-particles on two samples of tellurium† have been made. In one sample the Te^{122} isotope had been enriched to 79.4 percent, and in the other sample the Te^{124} isotope had been enriched to 83.9 percent. A previously unreported 20±1-hour activity appeared in the Te^{122} sample.

By means of a chemical separation this 20-hour activity was shown to be due to a gas, presumably xenon. The bombarded sample of Te^{122} was dissolved in a melted flux of sodium carbonate and sodium nitrate, to which had been added some potassium bromide to serve as a carrier for any iodine produced by an α,p reaction during bombardment. The mixture was heated in an evacuated chamber until any gaseous products of the bombardment had been driven off. The fluxing chamber was then cooled, to allow the mixture to solidify and to condense any possible, although unlikely, halogen vapors. The remaining gas was swept, with air, into a thin-window glass sample holder. This technique was first checked by use with a sample of Hilger tellurium bombarded with alpha-particles, from which the 5.3-day $xenon^{133}$ was found to be separated satisfactorily.

The reaction leading to the 20-hour activity is then $Te^{122}(\alpha,n)Xe^{127}$. Few positrons, if any, are emitted by this xenon activity.

The presence of x-rays that would accompany K-capture or internal conversion was investigated. Aluminum foil absorption measurements were made with a Wulf electrometer fitted with a magnet arranged to deflect any primary or secondary charged particle radiation away from the ionization chamber. The absorption data showed the presence of x-rays of wave-length 0.44A, corresponding to the K x-rays of iodine. From absorption measurements repeated at intervals it was possible to show that the intensity of the x-radiation decayed with a half-life of the order of 20 hours. This would seem to establish that the 20-hour Xe^{125} activity decays, in large measure, by K-capture.

Absorption measurements with copper indicated that a weak 0.6 Mev gamma-ray was also associated with this activity.

Xenon 127: An activity of 34-days half-life has been obtained by a proton bombardment of iodine.[1] The assignment was tentatively made to Xe^{127}.[2] This assignment may now be considered reasonably certain since the activity is readily obtained by bombarding enriched Te^{124} with alpha-particles. The activity obtained by the reaction $Te^{124}(\alpha,n)Xe^{127}$ has a half-life of 32±2 days.

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† Supplied by the Y-12 Plant, Carbide and Carbon Chemicals Corporation, through the Isotopes Division, U. S. Atomic Energy Commission, Oak Ridge, Tennessee.
[1] Creutz, Delsasso, Sutton, White, and Barkas, Phys. Rev. **58**, 481 (1940).
[2] G. T. Seaborg and I. Perlman, Rev. Mod. Phys. **20**, 585 (1948); Josef Mattauch and Arnold Flammersfeld, "Isotopenbericht," Zeits. f. Naturforschung, Tübingen (1949).

Units of Radioactivity

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IN November, 1947, a joint committee of the Divisions of Chemistry and Chemical Technology and of Mathematical and Physical Sciences of the National Research Council was appointed to make recommendations regarding standards and units of radioactivity. This committee unanimously adopted the recommendations quoted below. The committee would like to point out that these recommendations effectively divorce the curie from the disintegration rate of radium by assigning to the former an arbitrary magnitude (3.7×10^{10} disintegration/sec.) approximately equal to the disintegration rate of radium. This arbitrary figure is therefore not influenced by any future revisions of the generally accepted disintegration rate of radium. This recommendation has been submitted to the Joint Commission on Standards, Units, and Constants of Radioactivity of the International Unions of Chemistry and Physics for the purpose of obtaining international agreement.

This changes, slightly, the meaning of the curie when applied to radium. For example 1 curie of radon is no longer, on the basis of these recommendations, the amount in equilibrium with 1 gram of radium, but is the amount undergoing 3.7×10^{10} disintegrations per second. Similarly, 1 mg and 1 mc of radium are no longer rigorously synonymous. This distinction has a number of precedents in physics; for example the international. ampere, now abolished, was not quite equal to the absolute ampere and the angstrom unit is nearly, but not quite, equal to 1000 x units.

> "*curie.*—The curie should be defined as that quantity of any radioactive species (radioisotope) undergoing exactly 3.700×10^{10} disintegrations per second.
> "*rutherford.*—The rutherford should be defined as that quantity of any radioactive species (radioisotope) undergoing 10^6 disintegrations per second.
> "*rhm.*—For the quantitative comparison of radioactive sources emitting gamma-rays, for which disintegration rates cannot be determined, the *roentgen per hour at one meter* (rhm) is recommended. This is not essentially a new unit since all units involved are well established, explicitly defined, and are in common usage."

The recommendation of this latter unit is a practical step to insure that, by its use, gamma-ray measurements are so made with instruments and under such conditions that measurements on a given isotope (nuclear species) made in any laboratory will be directly comparable with similar measurements made in other laboratories. This will result, if the procedures used comply with the definition of the unit; that is, a source is 1 rhm if it produces 1 roentgen per hour at a distance of 1 meter.

* Chairman.

Effect of He^3 on the λ-Point of He^4

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IN a recent letter de Boer[1] has discussed the effect of He^3 on the λ-transition of He^4, and has come to the conclusion that admixture of He^3 will cause the transition to become first-order, instead of second-order. The possibility of the transition becoming first-order was pointed out by London and Rice;[2] however, later considerations have led me to believe that the transition will remain second-order.[3]

Both of our treatments[1,3] are based on the assumption of Taconis, Beenakker, Nier, and Aldrich[4] that He^3 is soluble only in the normal part of He^4, and not in the superfluid part, below the λ-point. The difference in our conclusions appears to arise from the fact that de Boer has made the assumption that the ratio of superfluid to normal fluid depends only on the temperature, and is independent of the concentration of He^3, below the λ-point;