We have not observed the 6.7-hour activity to be formed by $Mo^{94}(\gamma,n)$ as can be seen from Fig. 4. If this reaction occurs to

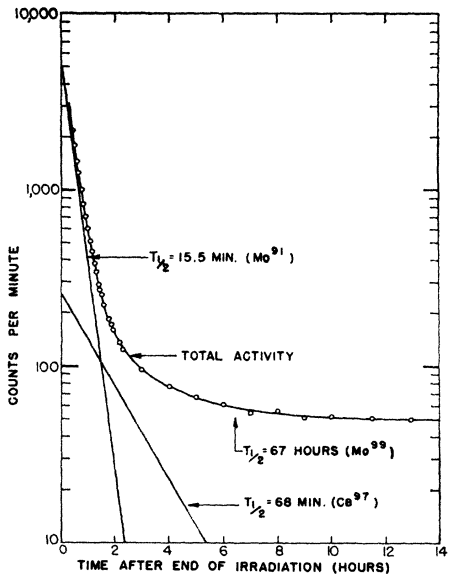

FIG. 4. Decay of total activity formed by 23 Mev x-rays on molybdenum containing 79.1 percent Mo^{94}

produce the 6.7-hour period, its cross section with 23 Mev x-rays must be less than 0.0005 that of the (γ,n) reactions for the other molybdenum isotopes. A further search for this activity was carried out on samples of enriched Mo^{92} and Mo^{94} which had been irradiated with slow neutrons in the pile at the Argonne National Laboratory. No evidence of decay with this half-life could be found.

It is interesting that the existence of the two isomers reported for Mo^{91} means that there are two well-established isomers for all the 49-neutron nuclei with even atomic number from 34 to 42. The prevalence of nuclear isomerism near the end of closed shells has been pointed out by Mrs. Mayer.[6]

* Assisted by the joint program of the ONR and the AEC.

[1] For a summary of previous work see G. T. Seaborg and I. Perlman, Rev. Mod. Phys. **20**, 585 (1948), also H. Wäffler and O. Hirzel, Helv. Phys. Acta **21**, 200 (1948).

[2] D. N. Kundu and M. L. Pool, Phys. Rev. **76**, 183 (1949).

[3] G. C. Baldwin and H. W. Koch, Phys. Rev. **67**, 1 (1945).

[4] M. G. Mayer, Phys. Rev. **74**, 235 (1948).

[5] The Mo^{92} and Mo^{94} samples used in this investigation were supplied by Carbide and Carbon Chemicals Corporation, Y-12 Plant, Oak Ridge, Tennessee, and obtained on allocation from the Isotopes Division of the AEC.

[6] M. G. Mayer, Phys. Rev. **76**, 185 (1949).

Beta-Decay of In^{115*} ‡

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A SCINTILLATION spectrometer and a magnetic lens spectrometer have been used to investigate the decay of In^{115*}. This substance decays mostly by isomeric transition to In^{115} ground state but a beta-spectrum has also been observed.

A sample of cadmium metal was bombarded in the pile for some hours and allowed to decay for 24 hours to remove the 4-hour cadmium activity. Cadmium and indium were then separated chemically after the addition of indium carrier. The indium fraction was discarded and indium activity allowed to grow from the 2.3-day cadmium parent. After 16 hours a few milligrams of indium carrier were added and the indium fraction separated. The indium as hydroxide was mounted on 0.5 mg/cm² polyethylene and measured in the anthracene scintillation spectrometer.

A plot of pulse counting rate in a small height interval against pulse height is shown as curve *A* in Fig. 1.

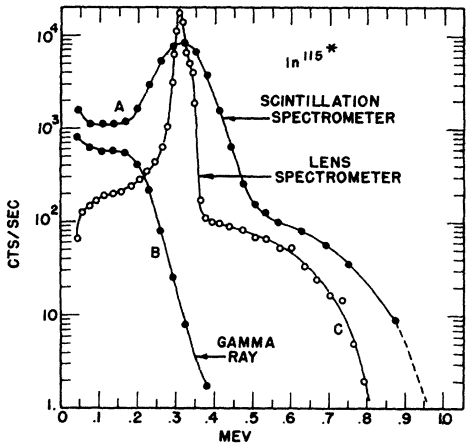

FIG. 1. Pulse counting rate as a function of pulse height.

The scale of pulse height was calibrated in Mev by using the 630-kev conversion line of Cs^{137}. The conversion line at 312 kev can be seen and also a beta-ray group containing about 1/10 as many electrons. Curve *B* is the Compton electron distribution produced by the gamma-ray when the electrons are cut off by an absorber. The curve shows evidence of only one strong gamma-ray group. All parts of curves *A* and *B* decay with the same 4.5-hour half-life. In order to make sure that the "β-ray" was not a defect in the scintillation spectrometer, a large sample was prepared and run in a magnetic lens spectrometer. The results, converted to a distribution as a function of energy rather than of momentum, are shown as curve *C* on Fig. 1. The β-ray is still seen and has about the same intensity (0.13) relative to the conversion line.

A Kurie plot of the lens spectrometer data above the conversion line is shown in Fig. 2. The plot is fairly straight and the endpoint

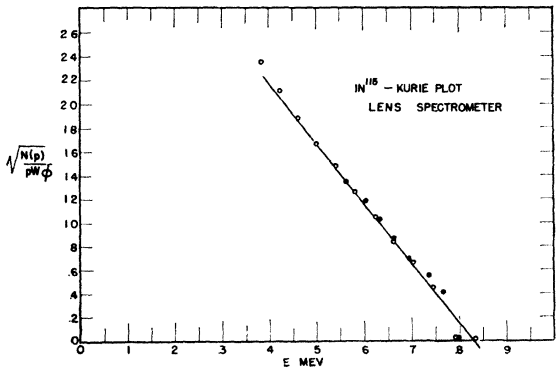

FIG. 2. Kurie plot of the lens spectrometer data.

seems to be 830±20 kev. If the 338-kev gamma-ray transition goes to the ground state of In^{115} and the 830-kev β-ray transition goes to the ground state of Sn^{115}, the energy difference between the two ground states would be 490 kev with In^{115} as the unstable member of the pair.

‡ This document is based on work performed under Contract No. W-7405, eng. 26 for the Atomic Energy Project at Oak Ridge National Laboratory.