In Table II, α-particle branching ratios derived from theoretical transition probabilities[12] are compared with the experimental branching ratios calculated from the observed γ-ray intensities. In agreement with previous observations on even-even α emitters the α transition intensity to the 2+ state is approximately equal to that predicted by theory without taking the spin correction into account, whereas the transitions to the 4+ state and 1− state are reduced by factors 0.11 and 0.24 respectively, in contrast to the theoretical spin correction factors 0.23 and 0.84 respectively.[13]

The proposed decay scheme for U^{232} is shown in Fig. 5.

unconverted γ rays emitted from Ac^{228}, found lines of 278 and 336 kev, which they assigned to transitions from a 336-kev level to the first excited state and ground state of Th^{228}. However, their Fig. 3 indicates that in the Ac^{228} decay the 336-kev line is much stronger than the 278-kev line, in contrast to the intensity ratio found in the U^{232} spectrum. This may be due to the superposition of a 347-kev line corresponding to a transition from a 404 kev, postulated by the authors, to the 57-kev level.

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Average Number of Neutrons per Spontaneous Fission of Cm^{244}†

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The average number of neutrons per fission, ν, for Cm^{244} has been measured by the manganous sulphate moderator-absorber system. The value 2.60±0.11 has been determined.

A SAMPLE of Cm^{244} was purified by ion-exchange techniques and electroplated on a platinum foil of about 20 cm^2 area. The foil was rolled tightly and the heat output from it was measured calorimetrically. The calorimeter used was of the steady-state resistance bridge type used at the Mound Laboratory.[1] The accuracy of the present measurement was about one percent. A small portion of the original sample was pulse analyzed and the fraction of Cm^{242} was measured and the total heat output was corrected for the contribution from this source. From the alpha disintegration energy and half-lives for alpha emission and spontaneous fission,[2] the number of fissions in the sample was determined.

The number of neutrons emitted from the sample was determined by placing it at the center of a tank containing a saturated solution of manganous sulphate. After the Mn^{56}, which was produced by the capture of a neutron by Mn^{55}, was in equilibrium with the neutrons from the sample, the activity in the solution was determined with an immersion counter. The efficiency of the tank and counter system was measured by finding the ratio of counter events to neutrons from several calibrated polonium-beryllium sources. Since the tank was infinitely large to the polonium-beryllium neutron spectrum, no correction for spectral differences was necessary.

Corrections were made for the contribution to the number of neutrons from the spontaneous fission of Cm^{242}, using the value of $\nu=3.0\pm0.3$ determined by Barclay and Whitehouse.[3] This correction amounted to about 0.8 percent. An upper limit for the contribution from neutrons produced by the alpha particles on low-Z elements was determined by preparing a sample of Cm^{242} in the same manner and measuring an apparent ν in the same system. The value determined was 3.68, as compared with 3.0 measured by coincidence methods, and since the ratio of decay by alpha emission to decay by spontaneous fission is about twenty-five times larger for Cm^{242} than for Cm^{244}, and the energy of the alpha particles emitted by Cm^{244} is about 0.4 Mev lower than those of Cm^{242}, the error introduced from this source is estimated as about one percent. While the precision of the measurements is ±1 percent, the accuracy of the standards may be in error by as much as 3 percent.

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