NOTIZEN

On the Beta Decay of ^{237}Pa

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There is a discrepancy on the decay of ^{237}Pa to ^{237}U in the literature. CRANE and IDDINGS [1] determined a half life of 10.5 ± 1 min, PATE and POSKANZER [2] found 10 min and TRAUTMANN, DENIG, KAFFRELL and HERRMANN [3, 4] measured 8.7 ± 0.2 min. But TAKAHASHI and MORINAGA [5] give a value of 39 ± 3 min. In order to solve this problem the experiment of Takahashi and Morinaga was repeated. Natural U_3O_8 was irradiated for 30 min with bremsstrahlung of the IKO electron linear accelerator (EVA) at Amsterdam (electron energy 50 MeV, electron current 5 μA). ^{237}Pa is expected to be produced by the reaction ^{238}U(γ,p)^{237}Pa. The chemical procedure suggested by NAKAI and YAJIMA [5, 6] was used to remove the fission products.

The gamma spectrum was measured with a Ge(Li) detector (30 cm^3) 30 min after the irradiation. The energy and decay time analysis of the gamma spectrum showed that most of the gamma lines arise from the beta decay of the fission products ^{131}Te, ^{134}Te and ^{134}I which have decay times close to 40 min. The strongest gamma lines which were observed also by Takahashi and Morinaga have the energies: 79.5 keV, 149.8 keV, 181.1 keV, 210.7 keV, 847.0 keV and 884.1 keV. These lines correspond to 79.5 keV of ^{134}Te [7], 149.7 keV of ^{131}Te [8], 181.1 keV and 210.8 keV of ^{134}Te [7] and 847.5 keV and 884.2 keV of ^{134}I [7]. No X-rays of U were detected. The beta end point energies of ^{131}Te and ^{134}I are close to the value measured by Takahashi and Morinaga (2.3 MeV). Therefore it must be concluded that ^{237}Pa does not have a half-life of 39 min.

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