

SOME PROBLEMS OF PRODUCING CONSISTENT VALUES OF THE DECAY CONSTANTS OF RADIOACTIVE NUCLIDES

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The conditions, the calculation schemes, and the results of calculation of time dependences of the activities A , of nuclides being the members of the ^{232}Th , ^{235}U , ^{238}U analyzed. In some cases the oscillations of value activities A around zero occur and some monotonic negative activities A is observed. This is caused by the limited accuracy of calculations using 32-bit computers. Among other possible causes of effects could be the absences of a mutual coordination of the experimental values of all set of the decay constants and branching ratios. These values appear in solutions of system of the differential equations, describing the decay and formation of nuclides.

The accord requirement includes the condition of non-negativity of the activities values (the negativity is admissible formally, but physically prohibited). This requirement is considered as the quite good filter to estimate and to clarify the values of the given constants. It is known that the experimental values of some of them may differ significantly. Therefore it is necessary to consider all spectrum of constant values.

It was expected that the iterative process of refinement of the decay constants values will make it possible of obtaining their mutually coordinated values, which can be considered as physically real. However, in some cases, such coordinated values (the chain ^{232}Th is considered) cannot be obtained. The possible reasons of such results are discussed.