Erratum: α decays to ground and excited states of heavy deformed nuclei [Phys. Rev. C 80, 034603 (2009)]

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We have found an error in our code for the Q-value calculations that appeared in the programming of the last summand of the following equation (see also Eq. (11) in the original article and Ref. [1]):

$$Q_{\text{g.s.}\to\text{g.s.}} = \Delta M_p - (\Delta M_d + \Delta M_\alpha) + k\left(Z_p^\epsilon - Z_d^\epsilon\right). \quad (1)$$

Here ΔM_p, ΔM_d, and ΔM_α are the atomic mass excess of the parent, daughter, and α nuclei, respectively; Z_p and Z_d are the number of protons in the parent and daughter nuclei, respectively; and k and ϵ are the coefficients. We consider that α decay is mainly a nuclear process and that the electronic shell processes are started after an emission of α particles from the nucleus. Therefore, the variation of bound energy of electrons in parent and daughter atoms at α decay described by the last term in Eq. (1) should be taken into account during Q-value evaluation.

The differences between values calculated earlier and corrected Q values are less than 5 keV for α emitters; see also Ref. [1]. The magnitudes of Q-value corrections are much smaller than typical α-decay Q values. Nevertheless the corrections lead to variations in the parameters of the model as well as to evaluated values of the half-lives. The maximum relative error of Q values considered in the article is 0.08%. The relative errors of α-decay half-lives induced by this error are less than 7.4%. Slight differences occur between old values and correced values of the branch ratios; the relative differences are less than 1.8%. The range of changes of the hindrance factors is the same as that for the half-lives.

Note that we use the parameters of the UMADAC model presented in Ref. [2]. However, we plan to reevaluate the values of those parameters soon.

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[1] V. Yu. Denisov and A. A. Khudenko, Phys. Rev. C **79**, 054614 (2009).

[2] V. Yu. Denisov and A. A. Khudenko, At. Data Nucl. Data Tables **95**, 815 (2009).

