Erratum: Q_{EC}-value determination for ^{21}Na → ^{21}Ne and ^{23}Mg → ^{23}Na mirror-nuclei decays using high-precision mass spectrometry with ISOLTRAP at the CERN ISOLDE facility [Phys. Rev. C 100, 015502 (2019)]

J. Karthein [*], D. Atanasov, K. Blaum, M. Breitenfeldt, V. Bondar, S. George, L. Hayen, D. Lunney, V. Manea, M. Mougeot, D. Neidherr, L. Schweikhard, N. Severijns, A. Welker, F. Wienholtz, R. N. Wolf, and K. Zuber

In our original publication concerning the Q-value determination for the ^{21}Na → ^{21}Ne and ^{23}Mg → ^{23}Na mirror-nuclei decays, the ionization energy was not included. The Q values of the presented β decays, hence, change by 17 eV in the case of ^{21}Na → ^{21}Ne and 3 eV in the case of ^{23}Mg → ^{23}Na. The essence of the paper, namely, the calculated $\mathcal{F}t$ values and the resulting V_{ud} element of the CKM-quark-mixing matrix are not affected due to dominating uncertainties in the other relevant quantities. Equation (4) in the original publication now reads

$$Q_{EC} = (r-1)(m_{ref,lit} - m_e)c^2 + rE_{i,ref} - E_{i,IOI}, \tag{4}$$

with the literature mass for the reference atom $m_{ref,lit}$, the electron mass m_e [1], the speed of light c, and the ionization energies for the reference atom and atom of interest, $E_{i,ref}$ and $E_{i,IOI}$ respectively. As a result, Table I is modified to:

TABLE I. Summary for ^{21}Na$^+$ and ^{23}Mg$^+$ showing the number of Ramsey-type spectra taken, the estimated production yield at ISOLDE, the half-lives [2], the reference ion for cyclotron frequency ratio determination, the measured cyclotron frequency ratio r, and the measured Q_{EC} values using ionization energies from the National Institute of Standards and Technology [3] in comparison with the ones published by Low-Energy Beam and Ion Trap (LEBIT) for ^{21}Na [5] and by TRIUMF Ion Trap for Atomic and Nuclear Science (TITAN) for ^{23}Mg [4].

Isotope	$N_{spectra}$	Yield (s^{-1})	$T_{1/2}$ (s)	Reference	Ratio r	Q_{EC} (keV)	
						This erratum	Literature
^{21}Na$^+$	30	6×10^6	22.422(10)	^{21}Ne$^+$	1.0001813796(9)	3546.919(18)	3547.11(9)
^{23}Mg$^+$	19	1×10^8	11.317(11)	^{23}Na$^+$	1.0001894144(15)	4056.179(32)	4056.35(16)

Based on the 17- and 3-eV changes in the Q values, Table II is updated to:

TABLE II. Calculated vector part of the statistical-rate function f_V, mirror-nuclei $\mathcal{F}t^{mirror}$ value, and the V_{ud} element of the Cabibbo-Kobayashi-Maskawa matrix for ^{21}Na and ^{23}Mg. For details, see the text.

Isotope	f_V	f_A/f_V	$\mathcal{F}t^{mirror}$ (s)	V_{ud}
^{21}Na	170.714(6)	1.0170(17)	4071(4)	0.9715(34)
^{23}Mg	378.51(2)	1.0195(20)	4724(14)	Not available

We thank W. J. Huang for bringing the discrepancy to our attention.

———
[*]Corresponding author: jonas.karthein@cern.ch

[1] S. Sturm, F. Köhler, J. Zatorski, A. Wagner, Z. Harman, G. Werth, W. Quint, C. H. Keitel, and K. Blaum, Nature (London) **506**, 467 (2014).

[2] G. Audi, F. G. Kondev, M. Wang, W. Huang, and S. Naimi, Chin. Phys. C **41**, 030001 (2017).

[3] A. Kramida, Y. Ralchenko, J. Reader, and NIST ASD Team (2019), *NIST Atomic Spectra Database* (version 5.7.1) [Online: 2020, February 8].

[4] B. E. Schultz, M. Brodeur, C. Andreoiu, A. Bader, A. Chaudhuri, U. Chowdhury, A. T. Gallant, A. Grossheim, R. Klawitter, A. A. Kwiatkowski, K. G. Leach, A. Lennarz, T. D. Macdonald, J. Lassen, H. Heggen, S. Raeder, A. Teigelhöfer, and J. Dilling, Phys. Rev. C **90**, 012501(R) (2014).

[5] M. Eibach, G. Bollen, M. Brodeur, K. Cooper, K. Gulyuz, C. Izzo, D. J. Morrissey, M. Redshaw, R. Ringle, R. Sandler, S. Schwarz, C. S. Sumithrarachchi, A. A. Valverde, and A. C. C. Villari, Phys. Rev. C **92**, 045502 (2015).