



Erratum to: High-precision mass measurement of doubly magic ^{208}Pb

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We found that the image charge shift (ICS) had an incorrect sign in the original paper. It should have been negative: $R_{\text{meas}} - \tilde{R} = \Delta(R_{\text{meas}})_{\text{ICS}} = -1.85(9) \times 10^{-10}$. This shifts the final mass value as well as the masses of the connected isotopes see Table 1. With the correct sign of the ICS, the systematically corrected cyclotron frequency ratio is: $R - 1 = 1.252\,196\,10(9)(10)(13) \times 10^{-4}$, where the number in the first, second, and third brackets indicate the statistical, systematic, and total uncertainty, respectively. This value is shifted by 3.7×10^{-10} in comparison to the original publication. As a result, the final atomic mass value of ^{208}Pb is shifted by $0.077\,\mu\text{u}$ to

$$m(^{208}\text{Pb}) = 207.976\,650\,494(14)\,\text{u}, \quad (1)$$

and the correct mass excess should be shifted by $71\,\text{eV}$ in comparison to the originally published value and amounts to $-21,749.927(13)\,\text{keV}$.

Moreover, in the original paper, R was defined as the mass ratio. However, the value given later in the paper is the ratio

of the cyclotron frequencies of the ions. To be consistent, we now change the definition of R in Eq. (3) of the original paper to be the ratio of cyclotron frequencies:

$$R = \frac{\omega_c(^{208}\text{Pb}^{41+})}{\omega_c(^{132}\text{Xe}^{26+})}. \quad (2)$$

In consequence, Eq. (4) should be changed as well

$$m(^{208}\text{Pb}) = \frac{41}{26R}m(^{132}\text{Xe}^{26+}) + 41m_e - E_{\text{Pb}}. \quad (3)$$

Furthermore, the q/m ratios given in the original publication were calculated using the atomic mass of the nuclides instead of the ionic mass. The correct ratios should be: $^{208}\text{Pb}^{41+}$: $q/m = 0.197\,159\,e/\text{u}$ and $^{132}\text{Xe}^{26+}$: $q/m = 0.197\,134\,e/\text{u}$. These values were not used in the analysis and therefore have no further impact on the results.

Lastly, in the original publication, there was an incorrect citation for the experiment Alphatrap at the MPIK in Heidelberg. The correct citation should have been [3].

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Table 1 New mass values of affected nuclides, when including the new mass value of this erratum of ^{208}Pb in the AME2020 [1]

Z	A	el.	$T_{1/2}$ [2]	AME2020 mass (μu)		Mass value this erratum (μu)	
81	203	Tl	Stable	202,972,344.1	(1.3)	202,972,342.5	(0.4)
81	204	Tl	3.783(12) y	203,973,863.4	(1.2)	203,973,861.88	(0.26)
82	204	Pb	$1.4(6) \times 10^{17}$ y	203,973,043.5	(1.2)	203,973,041.98	(0.18)
81	205	Tl	Stable	204,974,427.3	(1.3)	204,974,425.7	(0.5)
82	205	Pb	$1.70(9) \times 10^7$ y	204,974,481.7	(1.2)	204,974,480.17	(0.13)
81	206	Tl	4.202(11) min	205,976,110.1	(1.4)	205,976,108.5	(0.7)
82	206	Pb	Stable	205,974,465.2	(1.2)	205,974,463.70	(0.12)
82	207	Pb	Stable	206,975,896.8	(1.2)	206,975,895.31	(0.06)
82	208	Pb	Stable	207,976,652.0	(1.2)	207,976,650.494	(0.014)
83	209	Bi	$2.01(8) \times 10^{19}$ y	208,980,398.6	(1.5)	208,980,396.9	(0.7)
82	210	Pb	22.20(22) y	209,984,188.4	(1.6)	209,984,186.7	(0.9)
83	210	Bi	5.012(5) d	209,984,120.2	(1.5)	209,984,118.6	(0.7)
84	210	Po	138.376(2) d	209,982,873.7	(1.2)	209,982,872.17	(0.14)
84	211	Po	0.516(3) s	210,986,653.2	(1.3)	210,986,651.7	(0.6)
84	212	Po	294.3(8) ns	211,988,868.0	(1.2)	211,988,866.48	(0.12)

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