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Corrigendum: Possible generation of heat from nuclear fusion in Earth's inner core

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The original version of this Article contained errors resulting from the incorrect calculation of formation energy in Equation 6. In the Abstract,

${}^2\text{D} + {}^2\text{D} + {}^2\text{D} \rightarrow {}^2\text{H} + {}^4\text{He} + 2\bar{\nu}_e + 20.85\text{ MeV}$. The possible heat generation rate can generation rate can be calculated as $8.12 \times 10^{12} \text{ J/m}^3$.

Now reads:

${}^2\text{D} + {}^2\text{D} + {}^2\text{D} \rightarrow {}^2\text{H} + {}^4\text{He} + e^- + \bar{\nu}_e + 21.63\text{ MeV}$. The possible heat generation rate can generation rate can be calculated as $1.27 \times 10^{15} \text{ J/m}^3$.

In addition, there was an error in the 'Introduction section', where

"Increase in paraeomagnetic magnitude between 2.7–2.1 billion years"

Now reads:

"Increase in palaeomagnetic magnitude between 2.7–2.1 billion years"

There were also errors in Equations 6, 7, 9, 10 and 11, which now read:

$${}^2\text{D} + {}^2\text{D} \rightarrow {}^1\text{H} + \text{T} + 4.03\text{ MeV (branching ratio: } \sim 50\%) \quad (6)$$

$$\rightarrow \text{T} + \text{n} + e^+ + \nu_e + 4.03\text{ MeV (by } \beta^+ \text{ decay)}. \quad (7)$$

$$\rightarrow {}^1\text{H} + {}^4\text{He} + e^- + \bar{\nu}_e + 17.6\text{ MeV (by } \beta \text{ decay)}. \quad (9)$$

$${}^2\text{D} + {}^2\text{D} + {}^2\text{D} \rightarrow {}^1\text{H} + {}^4\text{He} + \text{n} + 21.63\text{ MeV} \quad (10)$$

$$\rightarrow {}^2\text{H} + {}^4\text{He} + e^- + \bar{\nu}_e + 21.63\text{ MeV}, \quad (11)$$

There were also errors in Equations 23, 24, 25 and 26 which now read:

$$\begin{aligned} H &= 5.27 \times 10^9 (\text{fusion/s/m}^3) \times 21.63 \times 10^6 (\text{eV/fusion}) \times 1.6022 \times 10^{-19} (\text{J}) \\ &= 1.826 \times 10^{-2} \text{ J/s/m}^3. \end{aligned} \quad (23)$$

$$\begin{aligned} H &= 1.826 \times 10^{-2} (\text{J/s/m}^3) \times 2.2 \times 10^9 (\text{year}) \times 365 (\text{day}) \times 24 (\text{hour}) \times 3,600 (\text{s}) \\ &= 1.267 \times 10^{15} \text{J/m}^3. \end{aligned} \quad (24)$$

$$(3.07 \times 10^{30} (\text{J})) / (1.267 \times 10^{15} (\text{J/m}^3)) = 2.42 \times 10^{15} \text{m}^3 \quad (25)$$

$$2.42 \times 10^{15} \text{m}^3 \times 7.44 / 0.3 = 6.00 \times 10^{16} \text{m}^3. \quad (26)$$

Under the sub-heading “Existence of a D-rich inner core”,

“On the other hand, because the incorporated gross weight of D from the creation of Earth’s core to present time is estimated as $6.67 \times 10^{21} \text{ kg}$ ($=100 \text{ Mkm}^3 \times 2 \text{ Mg/m}^3 \times 4/20 \times 1/0.006$), the volume of Fe-D crystals up through the present is $4.99 \times 10^{17} \text{ m}^3$ ($6.67 \times 10^{21} / 13.36 [\text{Mg/m}^3]$), resulting in an unreacted (Fe-D) crystal volume of $4.39 \times 10^{17} \text{ m}^3$ ($=4.99 \times 10^{17} - 6.23 \times 10^{16}$)”.

Now reads:

“On the other hand, because the incorporated gross weight of D from the creation of Earth’s core to present time is estimated as $6.67 \times 10^{21} \text{ kg}$ ($=100 \text{ Mkm}^3 \times 2 \text{ Mg/m}^3 \times 4/20 \times 1/0.006$), the volume of Fe-D crystals up through the present is $4.99 \times 10^{17} \text{ m}^3$ ($6.67 \times 10^{21} / 13.36 [\text{Mg/m}^3]$), resulting in an unreacted (Fe-D) crystal volume of $4.39 \times 10^{17} \text{ m}^3$ ($=4.99 \times 10^{17} - 6.00 \times 10^{16}$)”.

Finally, there was an error in the ‘Conclusions’ section where:

Now reads:

These errors have now been corrected in the HTML and PDF versions of this Article.

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