



HAL
open science

Erratum: Otho-Para H 2 Conversion by Proton Exchange at Low Temperature: An Accurate Quantum Mechanical Study [Phys. Rev. Lett. 107 , 023201 (2011)]

P. Honvault, M. Jorfi, T. Gonzalez-Lezana, A. Faure, L. Pagani

► To cite this version:

P. Honvault, M. Jorfi, T. Gonzalez-Lezana, A. Faure, L. Pagani. Erratum: Otho-Para H 2 Conversion by Proton Exchange at Low Temperature: An Accurate Quantum Mechanical Study [Phys. Rev. Lett. 107 , 023201 (2011)]. Physical Review Letters, 2012, 108 (10), 10.1103/PhysRevLett.108.109903 . hal-02870226

HAL Id: hal-02870226

<https://hal.science/hal-02870226v1>

Submitted on 16 Mar 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

Erratum: Otho-Para H₂ Conversion by Proton Exchange at Low Temperature: An Accurate Quantum Mechanical Study [Phys. Rev. Lett. 107, 023201 (2011)]

P. Honvault, M. Jorfi, T. González-Lezana, A. Faure, and L. Pagani
(Received 7 February 2012; published 8 March 2012)

DOI: 10.1103/PhysRevLett.108.109903

PACS numbers: 34.50.Lf, 82.20.Ej, 82.20.Pm, 95.30.Ft, 99.10.Cd

In the Letter [1], the rate coefficients in Fig. 2 were miscalculated. The corrected result is shown in the bottom figure. Actually, we used the cross sections shown in Fig. 1 [1] but we considered them in Å^2 and not in a_0^2 . This caused an artificial increase of rate coefficients. In the correct calculations of rate coefficients, we used the cross sections in a_0^2 . In connection with this revision, in the abstract the value of $4.15 \times 10^{-10} \text{ cm}^3 \cdot \text{molecule}^{-1}$ must be replaced by the value of $1.16 \times 10^{-10} \text{ cm}^3 \cdot \text{molecule}^{-1}$. At the 7th line from the top in the right column on page 3, the sentence is revised as “It slightly depends on temperature and keeps an almost constant value around $1.5 \times 10^{-10} \text{ cm}^3 \cdot \text{molecule}^{-1} \cdot \text{s}^{-1}$, which is about 1/17 of the (temperature independent) Langevin rate value ($2.5 \times 10^{-9} \text{ cm}^3 \cdot \text{molecule}^{-1} \cdot \text{s}^{-1}$).” At the 5th line from the top in the left column on the last page, the sentence is revised as “For example, at 10 K, the TIQM rate coefficient is $1.16 \times 10^{-10} \text{ cm}^3 \cdot \text{molecule}^{-1} \cdot \text{s}^{-1}$ while the SM value is $2.97 \times 10^{-10} \text{ cm}^3 \cdot \text{molecule}^{-1} \cdot \text{s}^{-1}$, yielding a decrease of 60%. Similarly, at 100 K, we have respectively $1.55 \times 10^{-10} \text{ cm}^3 \cdot \text{molecule}^{-1} \cdot \text{s}^{-1}$ and $2.10 \times 10^{-10} \text{ cm}^3 \cdot \text{molecule}^{-1} \cdot \text{s}^{-1}$. The new rate is thus 1.35 times smaller at that temperature.”

The main conclusions of the Letter [1] are unchanged. The corrected rate coefficients are still very different from the previous published rate coefficients.

We wish to thank Ronald McCarroll for having spotted the error.

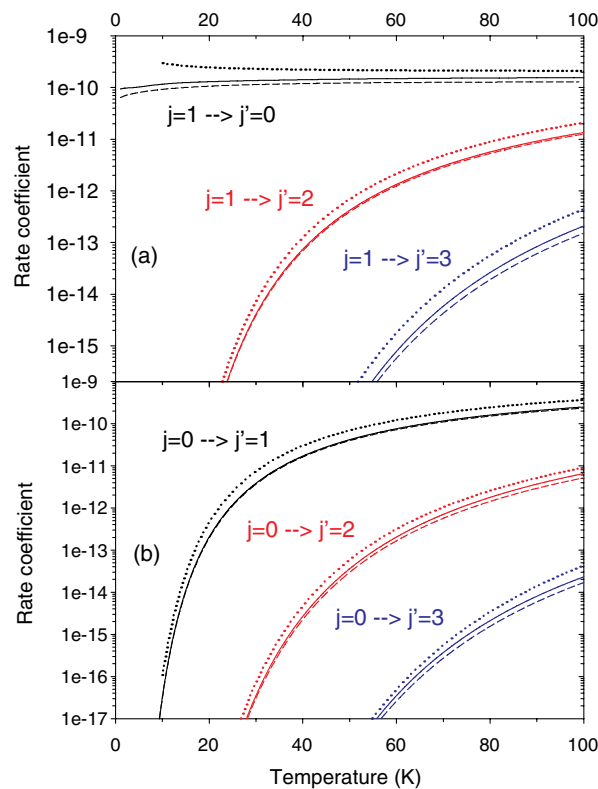


FIG. 2 (color online). TIQM (solid line), SQM (dashed line), and SM (dotted line) rate coefficients (in $\text{cm}^3 \cdot \text{molecule}^{-1} \cdot \text{s}^{-1}$) as a function of the temperature for $\text{H}^+ + \text{H}_2(v=0, j=1) \rightarrow \text{H}^+ + \text{H}_2(v=0, j')$ (a) and $\text{H}^+ + \text{H}_2(v=0, j=0) \rightarrow \text{H}^+ + \text{H}_2(v=0, j')$ (b).

[1] P. Honvault, M. Jorfi, T. Gonzalez-Lezana, A. Faure, L. Pagani, *Phys. Rev. Lett.* **107**, 023201 (2011).