Journal of Physical and Chemical Reference Data

ERRATUM | MARCH 26 2021

Erratum: "Wide-Ranging Reference Correlations for Dilute Gas Transport Properties Based on *Ab Initio* Calculations and Viscosity Ratio Measurements" [J. Phys. Chem. Ref. Data 49, 013101 (2020)] FREE

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J. Phys. Chem. Ref. Data 50, 019901 (2021)
https://doi.org/10.1063/5.0048579

AIP Publishing

Journal of Physical and Chemical Reference Data ERRATUM scitation.org/journal/jpr

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Cite as: J. Phys. Chem. Ref. Data 50, 019901 (2021); doi: 10.1063/5.0048579
Submitted: 24 February 2021 • Accepted: 25 February 2021 •
Published Online: 26 March 2021

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The authors regret that in the original published version of the manuscript, the claimed uncertainty values appearing in the Abstract, Sec. 4, and the Conclusions differed slightly from those shown in Table 10.

The statement in the Abstract should read "The new reference dilute gas viscosity correlations span temperature ranges from at least 150 K to 1200 K, with relative uncertainties up to 90% (methane) lower than the original *ab initio* results. For the noble gases, *ab initio* calculations for the Prandtl number are used to develop reference correlations for thermal conductivity ranging from at least 100 K to 5000 K, with relative uncertainties ranging from 0.05% (krypton) to 0.11% (xenon)."

In the last paragraph of Sec. 4 (p. 10), the sentence should read "Exceptions to this include the revised data from May *et al.*,[1] which have had their uncertainty reduced by factors of between 1.3 and 2.2 (or, equivalently, a fractional change of between 23% and 55%) and are up to 90% smaller than the uncertainties of the values calculated with the corresponding *ab initio* pair potentials listed in Table 6."

The statement in the Conclusions should read "For fluids other than helium, this approach reduces the uncertainty currently achievable via a direct *ab initio* calculation by up to 90%: between 200 K and 400 K, the relative uncertainties of the reference viscosity correlations range from about 0.05% for Kr and H_2 to about 0.3% for propane. New reference correlations for the dilute gas thermal conductivity of five noble gases were also developed, covering the temperature range at least (100–5000) K with relative uncertainties ranging from 0.05% for krypton to 0.11% for xenon."

The authors also note that corrections are needed in the following places (note that reference numbers in this Erratum refer to the Reference list in this Erratum, not to the numbering in the original paper):

In the Introduction, Paragraph 3 (p. 2) should have "(84 K–10 000 K for argon[2])" instead of "(83 K–10 000 K for argon[2])."

In Sec. 3, Table 6 should be replaced:

TABLE 6. List of the authors, temperature ranges, and the relative uncertainties in the viscosity, $u_r(\eta)$, and thermal conductivity, $u_r(\lambda)$, calculated from the corresponding *ab initio* potential.

Gas	Authors	Temperature range (K)	$10^2 u_r(\eta)$	$10^2 u_r(\lambda)$
Helium	Cencek *et al.*[3]	1–10 000	0.001	0.001
Neon	Bich *et al.*[4,5]	25–10 000	0.1	0.1
Argon	Vogel *et al.*[2]	83.81–10 000	0.1	0.1[a]
Krypton	Jäger *et al.*[6]	70–5 000	0.13	0.13
Xenon	Hellmann *et al.*[7]	100–5 000	0.14	0.14
Methane	Hellmann *et al.*[8]	80–1 500	1[b]	
Nitrogen	Hellmann[9]	70–3 000	0.5[a]	
Hydrogen	Mehl *et al.*[10]	20–2 000	0.08[a,c]	
			1[b,d]	
Ethane	Hellmann[11]	90–1 200	0.15[e]	
			0.5[f]	
Propane	Hellmann[12]	150–1 200	1[g]	
			0.5[h]	

[a]The viscosity values calculated *ab initio* were re-scaled to match experimental results but no further uncertainty estimate was provided.[13] The uncertainty value here is taken from the original paper.
[b]The uncertainty was not mentioned in the publication and was estimated in this work based on comparisons with experimental measurements and other theoretical calculations.
[c]For 200 K < T < 400 K.
[d]For other temperatures.
[e]For 250 K < T < 700 K.
[f]For other temperatures.
[g]For 150 K < T < 250 K and 700 K < T < 1200 K.
[h]For 250 K < T < 700 K.

In Sec. 5, the first line should read "Deviation statistics between literature data from 70 sources and the reference equations developed in this work are shown in Table 11."

For some of the literature sources, the claimed uncertainties or the transport property values were cited incorrectly. Table 11 should read as follows:

TABLE 11. Summary of literature sources for experimental dilute gas transport properties.[a]

Authors	Uncertainty (%)[b]	T (K)	N[c,d]	RMS (%)	Bias (%)
Viscosities					
Helium					
Berg[14,15]	0.035	298.15	1	0.08	0.08
Clarke and Smith[16]	1.0	77.45–373.90	10	0.70	0.62
Dawe and Smith[17]	1.0	293.2–1600	15	1.44	−1.12
Gough *et al.*[18]	1.0	120–320	11	0.70	0.56
Kestin *et al.*[19]	0.2	328.15–678.15	7	0.33	0.30
Kestin *et al.*[20]	0.3	298.15–778.15	9	0.44	0.41
Maitland and Smith[21]	1.5	295–1533	11	1.52	−0.87
Seibt *et al.*[22]	0.30	293.15	1	0.29	−0.29
Tanaka *et al.*[23]	1.0	298.15–323.15	2	0.93	0.93
Vogel *et al.*[24]	0.3	294.46–647.92	20	0.11	0.10
Neon					
Clarke and Smith[16]	1.0	77.45–373.90	10	0.75	0.66
Dawe and Smith[17]	1.0	293.2–1600	15	1.39	−0.98
Edwards[25]	1.0	194.75–717.65	6	1.04	−0.82

TABLE 11. (*Continued.*)

Authors	Uncertainty (%)[b]	T (K)	N[c,d]	RMS (%)	Bias (%)
Evers *et al.*[26]	0.15	298.15–348.15	2	0.06	0.03
Johnston and Grilly[27]	0.5	80–300	27	1.00	−0.88
Trautz and Zimmermann[28]	0.4	90–523	13	1.55	−1.42
Argon					
Clarke and Smith[29]	0.5	114.35–374.60	12	0.38	0.32
Dawe and Smith[17]	1.0	293.2–1600	15	0.76	−0.31
Gough *et al.*[18]	1.0	120–320	11	0.48	0.46
Hurly *et al.*[30]	0.36	293.15–373.15	5	0.15	0.15
Lin *et al.*[31]	0.062	298.15–653.15	14	0.08	−0.07
Maitland and Smith[21]	1.5	295–1533	11	0.61	−0.067
May *et al.*[1] (this work)	0.038	202.71–394.20	21	0.019	−0.010
Vogel[32]	0.2	291.09–681.96	49	0.042	−0.033
Zhang *et al.*[33]	0.082	243.15–393.15	17	0.041	−0.032
Krypton					
Dawe and Smith[17]	1.0	293.2–1600	15	0.81	−0.29
Gough *et al.*[18]	1.0	120–320	11	0.48	0.47
Humberg and Richter[34]	0.13	253.20–473.37	8	0.06	−0.011
Lin *et al.*[35]	0.10	243.15–393.15	16	0.05	0.03
Maitland and Smith[21]	1.5	295–1553	10	0.69	−0.26
Vogel[36]	0.1[e] 0.2[f]	296.75–689.81	52	0.088	−0.019
Wilhelm and Vogel[37]	0.2	298.15–348.15	2	0.22	0.22
Xenon					
Clarke and Smith[29]	0.5	176.0–374.6	9	0.33	0.28
Dawe and Smith[17]	1.0	293.2–1600	15	0.68	0.07
Lin *et al.*[35]	0.11	303.15–393.15	9	0.06	0.05
May *et al.*[1] (this work)	0.084	202.88–298.15	7	0.014	-8×10^{-5}
Rigby and Smith[38]	1.0	293–972	14	1.38	−1.08
Vogel[36]	0.1[g] 0.2[h]	295.04–649.53	20	0.085	0.013
Methane					
Dawe *et al.*[39]	1.0	293–1050	9	0.57	0.29
Gough *et al.*[18]	1.0	150–320	10	0.62	0.61
Humberg *et al.*[40]	0.25	253.16–473.17	9	0.09	−0.058
May *et al.*[1] (this work)	0.067	210.76–391.55	13	0.050	0.011
Meerlender and Aziz[41]	1.0	293.15–353.15	6	0.39	−0.36
Schley *et al.*[42]	0.3	260–360	6	0.036	0.020
Vogel[43]	0.2	289.05–682.14	35	0.21	0.20
Hydrogen					
Barua *et al.*[44]	0.22	223.15–423.15	6	0.42	−0.23
Gracki[45]	0.11	173.15–298.15	3	0.44	−0.41
Hongo and Iwasaki[46]	0.3	298.15–373.15	4	0.39	−0.026
May *et al.*[1] (this work)	0.055	213.62–394.21	15	0.016	0.014
Van Cleave and Maass[47]	1.0	89.75–295.15	2	0.54	−0.54

TABLE 11. (*Continued.*)

Authors	Uncertainty (%)[b]	T (K)	N[c,d]	RMS (%)	Bias (%)
Nitrogen					
El Hawary[48]	0.25	253.16–473.17	7	0.52	0.47
Hoogland *et al.*[49]	0.1	298.11–333.10	5	0.11	0.098
Humberg *et al.*[50]	0.10	253.21–473.38	9	0.066	−0.060
Seibt *et al.*[51]	0.3	298.15–423.15	4	0.099	0.086
Seibt *et al.*[22]	0.3	293.18–423.11	2	0.34	−0.32
Trautz and Baumann[52]	1.0	195.15–523.25	19	1.08	−0.70
Vogel[53]	0.20	291.55–681.99	17	0.064	0.050
Ethane					
Iwasaki and Takahashi[54]	0.3	298.15–348.15	8	0.19	−0.13
Wilhelm *et al.*[55,56]	0.25	289.97–429.96	8	0.35	−0.34
Vogel *et al.*[57,58]	0.3	289.83–675	19	0.054	−0.022
Propane					
Abe *et al.*[59]	0.3	298.15–468.15	5	0.70	0.60
Holland *et al.*[60]	1.0	160–500	18	0.77	0.48
Kestin *et al.*[61]	0.2	298.15–478.18	13	0.93	0.85
Seibt *et al.*[62]	0.3	273.18–366.10	3	0.93	−0.58
Vogel[63]	1.0	297.24–625.80	70	0.28	0.19
Wilhelm and Vogel[64,65]	0.25	298.21–423.09	7	0.24	−0.19
Thermal conductivities					
Helium					
Assael *et al.*[66]	0.2	308.15	1	0.08	−0.08
Baker[67]	0.5	300–600	8	0.21	−0.06
Kestin *et al.*[68]	0.3	300.65	1	0.55	0.55
Mukhopadhyay and Barua[69]	1.0	90.18–473.25	6	0.52	−0.38
Mustafa *et al.*[70]	0.5	308.11–425.44	4	1.41	1.38
Neon					
De Groot *et al.*[71]	1.5	301.16	1	1.38	−1.38
Kestin *et al.*[68]	0.3	300.65	2	0.020	0.017
Keyes[72]	2.0	91.05–273.15	5	1.19	−1.17
Sengers *et al.*[73]	1.0	298.15–348.15	5	0.62	−0.60
Sevast'yanov and Zykov[74]	2.0	100–600	12	0.78	−0.67
Argon					
Assael *et al.*[66]	0.2	308.15	1	0.32	0.32
Haran *et al.*[75]	0.3	308.15–429.15	5	0.63	0.42
May *et al.*[1] (this work)	0.038	202.71–394.20	21	0.017	−0.009
Millat *et al.*[76]	0.3	308.15–428.15	4	0.77	0.69
Roder *et al.*[77]	0.5	300.81–340.87	48	0.46	−0.08
Sun *et al.*[78]	1.0	296.84–427.80	36	0.39	−0.009
Krypton					
Assael *et al.*[66]	0.2	308.15	1	0.17	0.17
Vargaftik[79]	2.0	125–700	13	1.80	1.53
Voshchinin *et al.*[80]	2.0	591–976	7	1.78	1.27

TABLE 11. (*Continued.*)

Authors	Uncertainty (%)[b]	T (K)	N[c,d]	RMS (%)	Bias (%)
Xenon					
Assael *et al.*[66]	0.20	308.15	1	0.23	0.23
Keyes[81]	NA	214.25–273.15	7	0.42	0.10
May *et al.*[1] (this work)	0.084	202.88–298.15	7	0.014	2×10^{-4}
Springer and Wingeier[82]	1.0	900–2500	9	0.70	−0.54

[a]Literature data measured at low pressures were also included and were corrected to the dilute gas condition via Rainwater and Friend theory.[83]
[b]The reported uncertainties sometimes change with temperature slightly. Under these circumstances, the largest uncertainty is given in the table.
[c]Some isothermal transport property data were reported at various pressures. In this case, only the lowest pressure point was corrected to the dilute gas condition for comparison.
[d]The N value only includes the points fitted in this work. Data that are inconsistent with other reported measurements were not included.
[e]For 295 K < T < 400 K.
[f]For 400 K < T < 690 K.
[g]For 295 K < T < 400 K.
[h]For 400 K < T < 650 K.

Some of the corrections in Table 11 affect the magnitude of the deviation for a given data point, the size of uncertainty bars, and the captions of Figs. 6–14. However, these have no significant impact on the deviation plots shown.

The authors would like to apologize for any inconvenience caused. Fortunately, these minor errors have no impact on the primary conclusions of the paper.

ACKNOWLEDGMENTS

The authors are grateful to Dr. Marcia L. Huber (National Institute of Standards and Technology) for pointing out the error in the claimed uncertainty reported in the Abstract.

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