SUPPORTING INFORMATION

Generation of recommendable values for the surface tension of water using a non-parametric regression

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Table S1. Literature sources of experimental data on the gas-liquid surface tension-temperature relation for water with year of publication, method, number of data in the data set, and the quantitative estimate of the data accuracy $u(\gamma)$ given by their author. The literature sources are ordered according to year of publication

author(s)	year	temp. range T/K	methods	no. data	$u(\gamma)$ mN·m^{-1}
Buliginsky [1]	1868	288.15	capillary rise	1	–
Rodenbeck [2]	1880	290.65	capillary rise	1	–
Volkmann [3]	1882	288.65–292.15	capillary rise	2	–
Traube [4]	1885	288.15	capillary rise	1	–
Ramsay and Shields [5]	1893	273.15–413.15	capillary rise	15	–
Humphreys and Mohler [6]	1895	264.85–291.65	capillary rise	41	–
Volkmann [7]	1895	273.15–313.15	capillary rise	15	–
Sentis [8]	1897	286.65–298.25	capillary rise	2	–
Sohet [9]	1898	289.15–423.65	capillary rise	6	–
Grabowsky [10]	1904	283.15–303.15	capillary rise	2	–
Hartley et al. [11]	1908	273.15–298.15	capillary rise	2	–
Grunmach [12]	1909	292.25	capillary waves	1	–
Drucker and Moles [13]	1910	291.15	capillary rise	1	–
Magini [14]	1911	291.15	capillary rise	1	–
Morgan and McAfee [15]	1911	273.15–350.15	drop weight	20	–
Grunmach [16]	1912	293.15	capillary waves	1	–
Morgan and Neidle [17]	1913	303.15	drop weight	1	–
Ferguson [18]	1914	288.95–289.15	maximum bubble pressure	3	–
Richards and Coombs [19]	1915	293.15	capillary rise	1	–
Sentis [20]	1915	273.15–353.15	capillary rise	4	–
Morgan and Davis [21]	1916	273.15–323.15	drop weight	3	–
Morgan and Egloff [22]	1916	273.15–338.15	drop weight	10	–
Harkins et al. [23]	1917	283.15–313.15	drop weight	18	–
Jaeger [24]	1917	273.55–373.05	capillary rise	11	–
Morgan and Scarlett [25]	1917	273.15–318.15	drop weight	3	–
Harkins and Brown [26]	1919	293.15	capillary rise	1	–
Richards and Palitzsch [27]	1919	293.15	drop weight	1	–
Harkins et al. [28]	1920	293.15	capillary rise	1	–
Maass and Hatcher [29]	1920	273.15–291.15	capillary rise	2	–
Stocker [30]	1920	290.15–296.95	capillary rise	15	0.14
Richards and Carver [31]	1921	293.15	capillary rise	2	–
Sugden [32]	1921	293.15	capillary rise	1	0.22
Bircumshaw [33]	1922	298.15	drop weight	1	–
Ferguson [34]	1922	288.15	pull on sphere	1	0.023
Sugden [35]	1922	293.15	maximum bubble pressure	1	–
Butler [36]	1923	283.15–343.15	capillary rise	7	–
Ferguson [37]	1923	290.35–293.95	capillary rise	5	–
Richards et al. [38]	1924	273.15–333.80	capillary rise	3	–
Ferguson and Vogel [39]	1926	287.15–297.05	Wilhelmy plate	3	–
Harkins and Gilbert [40]	1926	298.15	pendant drop	1	–
Rehbinder [41]	1926	283.15–373.15	maximum bubble pressure	5	–
Moser [42]	1927	273.15–373.10	du Noüy ring	79	–
Warren [43]	1927	273.15–363.15	capillary rise	19	0.05
Harkins and Jordan [44]	1930	298.15	du Noüy ring	16	0.2
Rehbinder and Taubmann [45]	1930	283.15–363.15	maximum bubble pressure	6	–
Butler and Wightman [46]	1932	298.15	maximum bubble pressure	1	0.05

Table S1. – continued

author(s)	year	temp. range T/K	methods	no. data	$u(\gamma)$ $\mathrm{mN{\cdot}m^{-1}}$
Butler and Lees [47]	1932	298.15	capillary rise	1	0.10
Ernst et al. [48]	1932	298.15	capillary rise	1	–
Ferguson and Kennedy [49]	1932	288.15–298.15	maximum bubble pressure	2	–
Speakman [50]	1933	292.15	capillary rise	1	–
Butler et al. [51]	1934	298.15	capillary rise	1	0.05
Belton [52]	1935	298.15	maximum bubble pressure	1	–
Sabinina and Terpugow [53]	1935	283.15–323.15	capillary rise	5	–
Trieschmann [54]	1935	295.15	maximum bubble pressure	1	0.15
Ernst et al. [55]	1936	298.15	capillary rise	1	–
Valentiner and Hohls [56]	1938	293.15–323.15	du Noüy ring	4	–
Cockett and Ferguson [57]	1939	290.45–346.25	capillary rise	29	–
Neros and Eversole [58]	1941	288.15–323.15	capillary rise	2	–
Smith and Sorg [59]	1941	298.15	pendant drop	1	–
Addison [60]	1943	286.15–333.15	vibrating-jet	4	–
Glagoleva [61]	1947	293.15–303.15	maximum bubble pressure	3	–
Grant et al. [62]	1948	273.15–373.15	differential bubbling	10	–
Urazovskij and Tchetaev [63]	1949	299.15–323.15	capillary rise	9	–
Douglas [64]	1950	298.15	pendant drop	2	0.1
Vierk and Fredenhagen [65]	1950	293.15	maximum bubble pressure	1	–
Voljak [66]	1950	273.15–643.15	capillary rise	40	–
Hacker [67]	1951	250.65–300.65	capillary rise	50	0.06
Teitelbaum et al. [68]	1951	273.15–333.15	capillary rise	11	–
Fox and Chrisman [69]	1952	293.15	du Noüy ring	1	0.035
Voronkov [70]	1952	293.15	maximum bubble pressure	1	0.05
Heiks et al. [71]	1954	374.95–497.55	capillary rise	10	–
Sutherland [72]	1954	292.25–294.55	oscillating jet	11	0.3
		293.15	du Noüy ring	1	0.1
Kovalenko et al. [73]	1956	298.15–313.15	maximum bubble pressure	2	–
Hoffmann et al. [74]	1957	288.15–293.15	du Noüy ring	2	0.2
Howard and McAllister [75]	1957	288.15–343.35	capillary rise	7	0.3
Murphy et al. [76]	1957	298.15	du Noüy ring	6	0.05
Hirata and Kanai [77]	1958	293.15	capillary rise	1	–
Krishna and Venkateswarlu [78]	1958	293.15	drop weight	1	–
Ling and Van Winkle [79]	1958	303.15–373.15	capillary rise	2	0.35
Ling and Van Winkle [80]	1958	303.15–373.15	capillary rise	2	0.5
Uchida and Matsumoto [81]	1958	303.15–363.15	capillary rise	7	–
Crawford and Van Winkle [82]	1959	373.15	capillary rise	1	0.5
Padday	1960	293.15	Wilhelmy plate	2	0.03
Padday	1960	293.15	du Noüy ring	1	0.1
Hasaba et al. [84]	1961	273.15–353.15	capillary rise	10	–
Slowinski and Masterton [85]	1961	300.15	Wilhelmy plate	1	0.05
Bordi and Vannel [86]	1962	284.15–317.65	capillary rise	16	–
Catchpole and Ellis [87]	1963	373.15	capillary rise	1	0.1
Nagy [88]	1963	298.15	drop weight	1	–
Drost-Hansen [89]	1965	298.15	capillary rise	1	–
Kowalska et al. [90]	1965	293.15	capillary rise	1	0.3
Murto et al. [91]	1967	293.15–303.15	maximum bubble pressure	3	–
Padday [92]	1968	293.15–313.15	Wilhelmy plate	3	–

Table S1. – continued

author(s)	year	temp. range T/K	methods	no. data	$u(\gamma)$ mN·m^{-1}
Gittens [93]	1969	278.17–318.15	capillary rise	86	–
		278.17–318.15	drop volume	118	–
Kawanishi et al. [94]	1970	298.35	Wilhelmy plate	1	–
Konobeev and Lyapin [95]	1970	293.15–333.15	capillary rise	2	–
Pike and Bonnet [96]	1970	303.15	Wilhelmy plate	1	–
Wright and Akhtar [97]	1970	303.15	capillary rise	1	0.08
Nakanishi et al. [98]	1971	303.15	capillary rise	1	0.3
Bonnet and Pike [99]	1972	293.15–313.15	Wilhelmy plate	3	0.25
Cini et al. [100]	1972	276.57–322.99	du Noüy ring	66	–
		283.69–320.16	Wilhelmy plate	13	–
Granzhan and Kirillova [101]	1972	298.15–353.15	maximum bubble pressure	4	–
Wagenbreth [102]	1972	273.15–313.15	capillary rise	5	–
Vargaftik et al. [103]	1973	273.55–643.54	capillary rise	147	–
Padday et al. [104]	1975	292.87–296.92	rod	20	0.3
Taylor and Mingins [105]	1975	293.15	Wilhelmy plate	1	0.04
Thakur and Hickman [106]	1975	372.50–372.96	Wilhelmy plate	9	–
Ramakrishnan et al. [107]	1976	293.15	maximum bubble pressure	2	0.07
Toryanik and Pogrebnyak [108]	1976	298.15–343.15	maximum bubble pressure	6	0.35
Artamonov et al. [109]	1977	298.15	drop weight	1	–
Tornberg [110]	1977	293.15–323.15	drop volume	5	0.33
Padday [111]	1979	298.90	cone	1	–
Patterson and Ross [112]	1979	293.15	pendant drop	1	–
Ross and Patterson [113]	1979	293.15	pendant drop	1	–
Furlong and Hartland [114]	1980	293.25–294.65	vertical cylinder	8	0.1
Won et al. [115]	1981	298.15	du Noüy ring	1	–
Pallas and Pethica [116]	1983	298.15	capillary rise	1	0.1
		298.15	Wilhelmy plate	1	0.02
Rotenberg et al. [117]	1983	293.15	sessile drop	1	–
		293.15	pendant drop	1	–
Drummond et al. [118]	1985	298.15	du Noüy ring	1	–
Cheong and Carr [119]	1987	298.15	du Noüy ring	1	1.4
Gaonkar and Neuman [120]	1987	293.15–298.15	Wilhelmy plate	2	0.04
Owens et al. [121]	1987	293.15	Wilhelmy plate	1	0.05
Braslau et al. [122]	1988	293.15	capillary waves	1	–
Jennings and Pallas [123]	1988	298.15	drop shape	1	0.3
Kalbassi and Biddulph [124]	1988	373.15	bubble detachment pressures	1	0.3
Ramkumar and Kudchadker [125]	1989	303.15–343.15	capillary rise	5	0.14
Cheng et al. [126]	1990	294.15	Wilhelmy plate	1	0.15
		294.15	ADSA-P	1	0.06
Floriano and Angell [127]	1990	245.95–333.15	capillary rise	63	–
Pallas and Harrison [128]	1990	293.15–298.15	drop shape	2	0.036
Wallenberger and Lyzenga [129]	1990	297.65	microwaves	1	1.6
Hansen and Rødsrud [130]	1991	294.15	pendant drop	2	0.2
Noordmans and Busscher [131]	1991	295.15–297.15	ADSA-P	10	1.3
Holcomb and Zollweg [132]	1992	293.15–303.15	capillary rise	3	0.9
		293.15–303.15	differential bubble pressure	3	0.1
Hansen [133]	1993	298.15	pendant drop	2	0.1
		298.15	sessile drop	3	0.1
		298.15	sessile bubbles	3	0.1

Table S1. – continued

author(s)	year	temp. range T/K	methods	no. data	$u(\gamma)$ mN·m^{-1}
Stückrad et al. [134]	1993	293.15	du Noüy ring	1	0.1
		293.15	oscillating drop	1	–
Gunde et al. [135]	1995	293.15	pendant drop	20	–
Kinart et al. [136]	1995	298.15	drop weight	1	0.07
Krotov et al. [137]	1995	293.15	touching drops	1	–
Rao and Enhorning [138]	1995	293.15	maximum bubble pressure	1	–
Trinh and Ohsaka [139]	1995	252.24–296.84	driven shape oscillation		–
			frequency + drop volume	15	0.7
Vázquez et al. [140]	1995	293.15–323.15	Wilhelmy plate	7	0.25
Semmler et al. [141]	1996	298.15	LASDA	1	0.06
Slauenwhite and Johnson [142]	1996	293.15	spinning single bubbles	1	–
Zhang et al. [143]	1996	293.15	sphere	2	–
Álvarez et al. [144]	1998	298.15–323.15	Wilhelmy plate	6	0.02
Hawrylak et al. [145]	1998	298.15	du Noüy ring	1	0.2
Tsierkezos and Molinou [146]	1998	283.15–323.15	du Noüy ring	5	0.1
Glinski et al. [147]	1999	293.15	Wilhelmy plate	1	–
Horozov and Arnaudov [148]	1999	297.15	fast formed drop	1	–
Nath [149]	1999	298.15	n/a	1	–
Gente and La Mesa [150]	2000	298.15	du Noüy ring	1	0.2
Lee et al. [151]	2000	298.15–323.15	capillary rise	6	–
Feenstra et al. [152]	2001	273.85–296.65	maximum bubble pressure	4	–
Glinski et al. [153]	2001	293.15	Wilhelmy plate	1	0.2
Gunde et al. [154]	2001	293.15	pendant drop	2	–
Maham and Mather [155]	2001	298.15–328.15	capillary rise	4	–
Yuan and Herold [156]	2001	296.65	drop weight	1	0.18
Kalies et al. [157]	2002	293.15	Wilhelmy plate	1	0.5
Kulankara and Herold [158]	2002	295.45	drop weight	1	2.0
Kumar et al. [159]	2003	298.15–318.15	Wilhelmy plate	3	0.03
Santos et al. [160]	2003	303.15	du Noüy ring	1	0.01
Alakoç et al. [161]	2004	298.15	oscillating capillary jet	6	3.5
Gómez-Díaz and Navaza [162]	2004	293.15–323.15	Wilhelmy plate	5	0.03
Hadrdová et al. [163]	2004	298.15	du Noüy ring	1	–
Hyvärinen et al. [164]	2004	297.20–298.15	Wilhelmy plate	2	1.4
Kijevcanin et al. [165]	2004	303.15	du Noüy ring	1	0.01
Li et al. [166]	2004	293.15	drop volume	1	0.04
Maham et al. [167]	2004	298.15–328.15	Wilhelmy plate	4	0.01
Sönmez and Cebeci [168]	2004	298.15	drop weight	1	–
Belda et al. [169]	2005	298.15	stalagmometer	1	–
Fujii [170]	2005	296.15–301.15	oscillating drop	9	3.5
Ali et al. [171]	2006	283.15–303.15	pendant drop	5	–
Dixmier [172]	2006	283.15–373.15	capillary pressure difference	5	–
Granados et al. [173]	2006	298.15	drop volume	1	0.03
Liu et al. [174]	2006	298.15	pendant drop	1	–
Richter and Vollhardt [175]	2006	295.15	Wilhelmy plate	1	–
Romero and Paéz [176]	2006	298.15	capillary rise	1	0.3
Enders et al. [177]	2007	288.15–328.15	pendant drop	5	0.2
Kilaru et al. [178]	2007	293.15	du Noüy ring	1	0.05
Lisa and Lisa [179]	2007	290.15–310.15	drop volume	3	0.05
Markarian and Terzyan [180]	2007	298.15–328.15	maximum bubble pressure	5	0.1

Table S1. – continued

author(s)	year	temp. range T/K	methods	no. data	$u(\gamma)$ $mN \cdot m^{-1}$
Romero et al. [181]	2007	283.15–308.15	capillary rise	6	0.3
Tuckermann [182]	2007	293.15	du Noüy ring	1	–
Fujimura and Iino [183]	2008	298.15	surface-wave resonance	1	0.14
García-Abuín et al. [184]	2008	293.15–323.15	Wilhelmy plate	5	0.07
Johnson et al. [185]	2008	303.15	du Noüy ring	1	0.01
Liu et al. [186]	2008	298.15	pendant drop	1	–
Williams et al. [187]	2008	278.15–298.15	du Noüy ring	5	3.0
Batchelor et al. [188]	2009	293.15	Wilhelmy plate	1	0.1
Rilo et al. [189]	2009	298.15	drop volume	1	–
Romero et al. [190]	2009	288.15–308.15	drop volume	5	0.01
Bermúdez-Salguero et al. [191]	2010	298.15	pendant drop	1	0.04
Mohsen-Nia et al. [192]	2010	293.15–323.15	maximum bubble pressure	6	0.08
Russo and Hoffmann [193]	2010	298.10–300.20	maximum bubble pressure	20	0.4
Sadeghi et al. [194]	2010	303.15–343.15	pendant drop	15	0.17
Zhang et al. [195]	2010	298.15	du Noüy ring	1	0.1
Rafati et al. [196]	2011	283.15–308.15	du Noüy ring	3	0.2
Russo and Hoffmann [197]	2011	296.80–321.30	maximum bubble pressure	8	0.4
Wang et al. [198]	2011	298.15	Wilhelmy plate	1	0.15
Han et al. [199]	2012	303.15–333.15	pendant drop	4	0.04
Khattab et al. [200]	2012	293.15–323.15	drop number	7	0.1
Quijada-Maldonado et al. [201]	2012	298.15	du Noüy ring	1	0.12
Begum et al. [202]	2013	303.15	Wilhelmy plate	1	0.51
Fu et al. [203]	2013	298.20–308.20	Wilhelmy plate	2	0.1
Hrubý et al. [204]	2014	248.27–273.10	capillary rise	26	0.15
Lago et al. [205]	2014	298.15	Wilhelmy plate	1	0.1
Ren et al. [206]	2014	298.15	Wilhelmy plate	1	0.1
Singh et al. [207]	2014	298.15	drop volume	1	0.2
Ameta and Singh [208]	2015	298.15–308.15	pendant drop	15	0.01
Cárdenas et al. [209]	2015	298.15	maximum bubble pressure	1	0.01
Chang et al. [210]	2015	298.15–328.15	Wilhelmy plate	4	0.2
Vinš et al. [211]	2015	247.23–303.36	capillary rise	64	0.15
This work	2015	272.64–343.48	Wilhelmy plate	33	0.03

Table S2. The present experimental air-liquid surface tension data for water at the pressure of 0.1 MPa. Mean values $\overline{T}$ and $\overline{\gamma}$ of the experimental readings of the temperature and surface tension, respectively, and the number of the averaged data readings [a]

$\overline{T}$/K	$\overline{\gamma}$/mN·m^{-1}	Number of data
272.64	75.78	20
273.04	75.71	75
275.06	75.41	54
276.72	75.17	24
280.09	74.69	45
280.34	74.65	47
283.27	74.23	78
286.54	73.74	50
288.33	73.46	53
290.57	73.12	64
293.04	72.74	85
294.13	72.58	52
295.71	72.33	78
297.40	72.07	79
298.42	71.91	47
299.35	71.77	106
300.30	71.62	68
301.78	71.39	51
302.43	71.28	46
303.41	71.13	61
304.45	70.96	62
305.69	70.76	84
306.63	70.61	58
307.99	70.39	66
310.60	69.97	69
313.69	69.47	38
316.02	69.07	92
318.49	68.66	83
323.62	67.79	85
328.10	67.03	81
333.49	66.10	76
337.83	65.34	47
343.49	64.33	15

[a] Standard uncertainties u ($k = 1$) for the state variables: $u(T) = 0.02$ K, $u(p) = 0.001$ MPa. Combined expanded uncertainty U_c with confidence level 0.95 ($k = 2$) for a single measurement of the property: $U_c(\gamma) = 0.03$ mN·m^{-1}.

Table S3. The present recommended data $\gamma_R(T)$ for the surface tension of water at selected temperatures, T, with corresponding reference interval $(\gamma_{min}, \gamma_{max})$, its center γ_C and half-width $\Delta\gamma$

T/K	γ_R/mN·m^{-1}	γ_{min}/mN·m^{-1}	γ_{max}/mN·m^{-1}	$(\gamma_C \pm \Delta\gamma)$/mN·m^{-1}
248.15	79.04	78.98	79.11	79.05 ± 0.06
253.15	78.40	78.35	78.46	78.40 ± 0.06
258.15	77.75	77.69	77.80	77.75 ± 0.05
263.15	77.07	77.03	77.12	77.07 ± 0.05
268.15	76.39	76.34	76.43	76.39 ± 0.04
273.15	75.69	75.65	75.72	75.69 ± 0.04
278.15	74.97	74.93	75.00	74.97 ± 0.04
283.15	74.24	74.21	74.27	74.24 ± 0.03
288.15	73.50	73.46	73.52	73.49 ± 0.03
289.15	73.35	73.31	73.37	73.34 ± 0.03
290.15	73.19	73.15	73.22	73.19 ± 0.03
291.15	73.04	73.00	73.07	73.03 ± 0.03
292.15	72.89	72.85	72.92	72.88 ± 0.03
293.15	72.74	72.69	72.76	72.73 ± 0.03
294.15	72.58	72.54	72.61	72.57 ± 0.03
295.15	72.43	72.38	72.45	72.42 ± 0.03
296.15	72.28	72.23	72.30	72.26 ± 0.03
297.15	72.12	72.07	72.14	72.11 ± 0.03
298.15	71.97	71.92	71.99	71.95 ± 0.04
299.15	71.81	71.76	71.83	71.80 ± 0.04
300.15	71.65	71.60	71.68	71.64 ± 0.04
301.15	71.50	71.45	71.52	71.48 ± 0.04
302.15	71.34	71.29	71.36	71.33 ± 0.04
303.15	71.18	71.13	71.21	71.17 ± 0.04
304.15	71.02	70.97	71.05	71.01 ± 0.04
305.15	70.86	70.81	70.89	70.85 ± 0.04
306.15	70.70	70.65	70.73	70.69 ± 0.04
307.15	70.54	70.49	70.57	70.53 ± 0.04
308.15	70.38	70.32	70.41	70.37 ± 0.04
313.15	69.57	69.51	69.60	69.56 ± 0.05
323.15	67.90	67.84	67.95	67.89 ± 0.05
333.15	66.19	66.12	66.24	66.18 ± 0.06
343.15	64.42	64.35	64.48	64.41 ± 0.07
353.15	62.60	62.53	62.67	62.60 ± 0.07
363.15	60.74	60.66	60.81	60.73 ± 0.07
373.15	58.83	58.75	58.90	58.82 ± 0.08
383.15	56.87	56.79	56.95	56.87 ± 0.08
393.15	54.88	54.80	54.95	54.87 ± 0.08
403.15	52.84	52.76	52.91	52.84 ± 0.08
413.15	50.76	50.69	50.84	50.76 ± 0.07
423.15	48.64	48.58	48.72	48.65 ± 0.07
433.15	46.49	46.43	46.57	46.50 ± 0.07
443.15	44.31	44.26	44.39	44.32 ± 0.07
453.15	42.10	42.05	42.17	42.11 ± 0.06
463.15	39.86	39.81	39.93	39.87 ± 0.06
473.15	37.59	37.55	37.66	37.60 ± 0.05
483.15	35.30	35.27	35.36	35.32 ± 0.05

Table S3. – continued

T/K	γ_R/mN·m^{-1}	γ_{min}/mN·m^{-1}	γ_{max}/mN·m^{-1}	$(\gamma_C \pm \Delta\gamma)$/mN·m^{-1}
493.15	32.99	32.97	33.05	33.01 ± 0.04
503.15	30.67	30.65	30.72	30.69 ± 0.03
513.15	28.33	28.32	28.39	28.35 ± 0.03
523.15	25.99	25.98	26.04	26.01 ± 0.03
533.15	23.64	23.63	23.69	23.66 ± 0.03
543.15	21.30	21.28	21.35	21.31 ± 0.03
553.15	18.96	18.94	19.01	18.97 ± 0.03
563.15	16.64	16.61	16.68	16.65 ± 0.04
573.15	14.34	14.31	14.38	14.35 ± 0.04
583.15	12.08	12.05	12.12	12.08 ± 0.03
593.15	9.86	9.83	9.90	9.86 ± 0.04
603.15	7.70	7.67	7.74	7.71 ± 0.04
613.15	5.63	5.60	5.67	5.63 ± 0.03
623.15	3.67	3.65	3.70	3.68 ± 0.03
633.15	1.88	1.87	1.91	1.89 ± 0.02
643.15	0.39	0.39	0.40	0.39 ± 0.01

Table S4. Literature sources of the a posteriori primary data on the surface tension for water with method, number of data in the data set, their root-mean-square (rmsd) and absolute systematic deviation (bias) from the recommended data, and the quantitative estimate of the data accuracy $u(\gamma)$ given by their author. The literature sources are ordered according to the root-mean-square deviation of the data from the present standard reference data

author(s)	year	method	no. data	$\|$bias$\|$ $mN{\cdot}m^{-1}$	rmsd $mN{\cdot}m^{-1}$	$u(\gamma)$ $mN{\cdot}m^{-1}$
Voronkov [70]	1952	maximum bubble pressure	1	0.003	0.003	0.05
Pallas and Pethica [116]	1983	Wilhelmy plate	1	0.004	0.004	0.02
Kalies et al. [157]	2002	Wilhelmy plate	1	0.005	0.005	0.50
Nath [149]	1999	n/a	1	0.005	0.005	–
Butler and Wightman [46]	1932	maximum bubble pressure	1	0.007	0.007	0.05
Butler et al. [51]	1934	capillary rise	1	0.007	0.007	0.05
Ernst et al. [48]	1932	capillary rise	1	0.007	0.007	–
Ling and Van Winkle [80]	1958	capillary rise	2	0.009	0.010	0.50
Padday [111]	1979	cone	1	0.011	0.011	–
Richards and Carver [31]	1921	capillary rise	2	0.007	0.012	–
Ali et al. [171]	2006	pendant drop	5	0.009	0.013	–
Lee et al. [151]	2000	capillary rise	6	0.011	0.013	–
Magini [14]	1911	capillary rise	1	0.014	0.014	–
Ameta and Singh [208]	2015	pendant drop	15	0.006	0.014	0.01
Enders et al. [177]	2007	pendant drop	5	0.011	0.017	0.20
Glinski et al. [147]	1999	Wilhelmy plate	1	0.018	0.018	–
Glinski et al. [153]	2001	Wilhelmy plate	1	0.018	0.018	0.20
Voljak [66], $T < T_b$	1950	capillary rise	11	0.019	0.022	–
Ernst et al. [55]	1936	capillary rise	1	0.023	0.023	–
Teitelbaum et al. [68]	1951	capillary rise	11	0.003	0.024	–
Hadrdová et al. [163]	2004	Wilhelmy plate	1	0.025	0.025	–
Lago et al. [205]	2014	Wilhelmy plate	1	0.025	0.025	0.10
Urazovskij and Tchetaev [63]	1949	capillary rise	9	0.023	0.026	–
this work	2015	Wilhelmy plate	33	0.021	0.027	0.03
Maham and Mather [155]	2001	capillary rise	4	0.027	0.030	–
Padday [92]	1968	Wilhelmy plate	3	0.025	0.032	–
Dixmier [172]	2006	capillary pressure diff.	5	0.020	0.032	–
Ling and Van Winkle [79]	1958	capillary rise	2	0.026	0.032	0.35
Belton [52]	1935	maximum bubble pressure	1	0.033	0.033	–
Kawanishi et al. [94]	1970	Wilhelmy plate	1	0.034	0.034	–
Hrubý et al. [204]	2014	capillary rise	26	0.000	0.034	0.15
Padday and Russell [83]	1960	Wilhelmy plate	2	0.008	0.036	0.03
Rotenberg et al. [117]	1983	pendant drop	2	0.035	0.036	–
Kumar et al. [159]	2003	Wilhelmy plate	3	0.022	0.038	0.03
Vázquez et al. [140]	1995	Wilhelmy plate	7	0.015	0.043	0.25
Álvarez et al. [144]	1998	Wilhelmy plate	7	0.015	0.043	0.02
Nakanishi et al. [98]	1971	capillary rise	1	0.044	0.044	0.30
Kowalska et al. [90]	1965	capillary rise	1	0.046	0.046	0.30
Wallenberger and Lyzenga [129]	1990	microwave	1	0.046	0.046	1.60
Sugden [32]	1921	capillary rise	1	0.047	0.047	0.22
Ferguson [18]	1922	pull on sphere	1	0.053	0.053	0.02
Harkins and Gilbert [40]	1926	pendant drop	1	0.053	0.053	–
Harkins and Brown [26]	1919	capillary rise	1	0.053	0.053	–

Table S4. – continued

author(s)	year	method	no. data	|bias| $mN{\cdot}m^{-1}$	rmsd $mN{\cdot}m^{-1}$	$u(\gamma)$ $mN{\cdot}m^{-1}$
Harkins et al. [28]	1920	capillary rise	1	0.053	0.053	–
Owens et al. [121]	1987	Wilhelmy plate	1	0.054	0.054	0.05
Crawford and Van Winkle [82]	1959	capillary rise	1	0.055	0.055	0.50
Humphreys and Mohler [6]	1895	capillary rise	41	0.012	0.056	–
Maham and Mather [155]	2004	Wilhelmy plate	4	0.044	0.056	0.01
Wright and Akhtar [97]	1970	capillary rise	1	0.056	0.056	0.08
Mohsen-Nia et al. [192]	2010	maximum bubble pressure	6	0.052	0.056	0.08
Richter and Vollhardt [175]	2006	Wilhelmy plate	1	0.061	0.061	–
García-Abuín et al. [184]	2008	Wilhelmy plate	5	0.012	0.061	0.07
Vinš et al. [211]	2015	capillary rise	64	0.012	0.062	0.15
Cini et al. [100]	1972	Wilhelmy plate	14	0.053	0.063	–
Pallas and Pethica [116]	1983	capillary rise	1	0.064	0.064	0.10
Han et al. [199]	2012	pendant drop	4	0.051	0.068	0.04
Furlong and Hartland [114]	1980	vertical cylinder	8	0.033	0.069	0.10
Vargaftik et al. [103], $T < T_\mathrm{b}$	1973	capillary rise	32	0.011	0.074	–
Rehbinder [41]	1926	maximum bubble pressure	5	0.027	0.075	–
Kovalenko et al. [73]	1956	maximum bubble pressure	2	0.056	0.075	–
Toryanik and Pogrebnyak [108]	1976	maximum bubble pressure	6	0.054	0.077	0.35
Russo and Hoffmann [193]	2010	maximum bubble pressure	20	0.059	0.083	0.40
Vargaftik et al. [103], $T > T_\mathrm{b}$	1973	capillary rise	115	0.018	0.089	–
Voljak [66], $T > T_\mathrm{b}$	1950	capillary rise	29	0.118	0.162	–

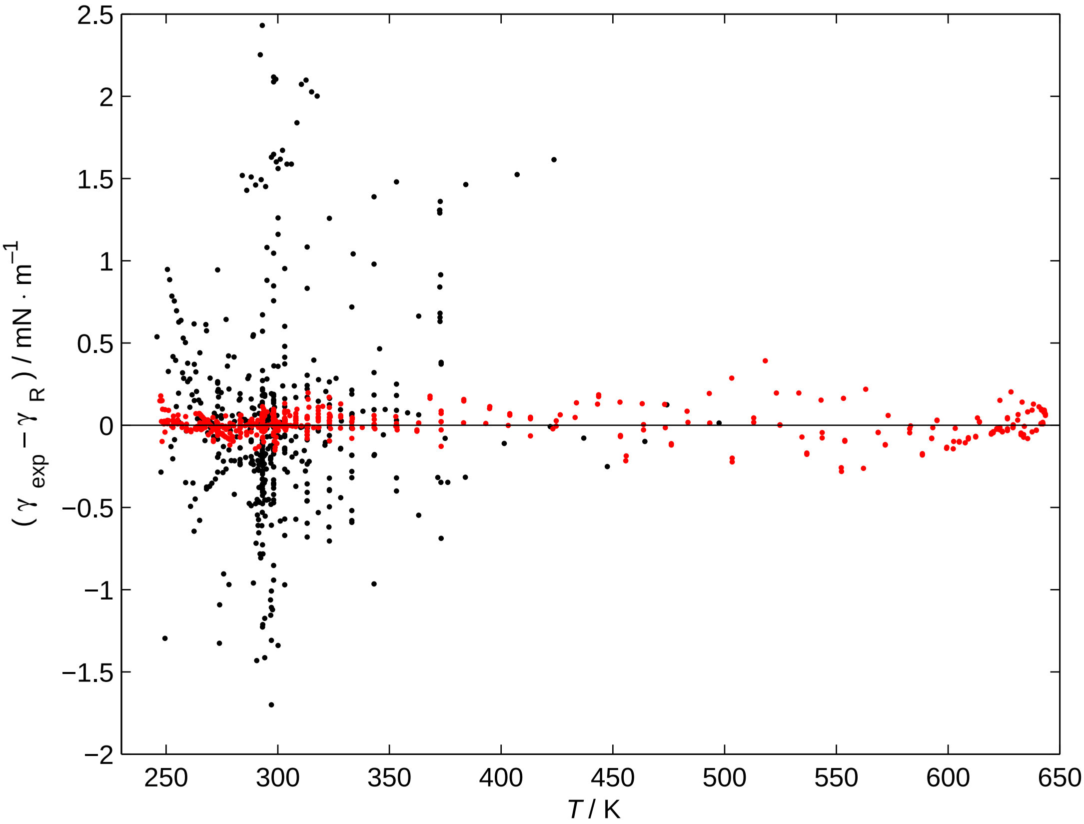

Figure S1. Deviations $\gamma_{\rm exp} - \gamma_{\rm R}$ of the experimental water surface tension values $\gamma_{\rm exp}$ from the recommended values $\gamma_{\rm R}(T)$ as a function of the temperature T. Red dot, primary data; Black dot, secondary data. The deviations are depicted for all 1055 density data points included in the generation of the recommended water surface tension values.

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