Electronic Supplementary Information(ESI) for New Journal of Chemistry.
This journal is © The Royal Society of Chemistry and the Centre National de la Recherche Scientifique 2023

Supporting Information

Correlation of Interfacial Tension with Density and Dielectric Constant for Binary Systems Containing Water and an Organic Component

Hongfei Wang [a] *, Chengjin Xu [b]

[a] *School of Chemistry and Chemical Engineering, Shaanxi University of Science and Technology, Xi'an 710021, PR China*

[b] *Institute for Smart Materials & Engineering, University of Jinan, Jinan 250022, PR China*

* To whom correspondence should be addressed

Email: 1599602526@qq.com

Table of Contents

Table S1 The data of ε_r and ρ of 41 organic liquids and the $\gamma_{ow\text{-}exp}$, $\gamma_{ow\text{-}cal}$, and $u_c(\gamma_{ow\text{-}cal})$ values of 41binary systems.

Organic liquids	T (K)	$\gamma_{ow\text{-}exp}$ (mN/m)[1,2]	$\gamma_{ow\text{-}cal}$ (mN/m)	$u_c(\gamma_{ow})$/ (mN/m)	ε_r [3]	ρ (g/cm^3) [4,5]
2,2,4-Trimethylpentane	293	50.0	51.4	0.126	1.943	0.692
2,2-Dimethyl butane	293	49.7	53.7	0.138	1.869	0.649
2,3-Dimethyl butane	293	49.8	53.0	0.134	1.889	0.662
2,4-Dimethyl pentane	293	50.0	52.5	0.131	1.902	0.673
3-Methyl pentane	293	49.9	52.9	0.134	1.886	0.664
2-Methyl pentane	293	48.9	53.4	0.136	1.886	0.653
3-Methyl hexane	293	50.4	51.7	0.128	1.920	0.687
Pentane	293	49.0	54.8	0.145	1.837	0.626
Hexane	293	49.7	53.2	0.135	1.887	0.659
Heptane	293	50.2	51.9	0.128	1.921	0.684
Octane	293	50.2	50.9	0.123	1.948	0.703
Cyclohexane	293	50.2	46.6	0.105	2.024	0.779
Nonane	293	52.4	50.0	0.119	1.972	0.718
Decane	293	53.2	49.4	0.116	1.985	0.730
Undecane	293	53.1	48.8	0.114	1.997	0.740
Dodecane	293	53.7	48.2	0.111	2.012	0.750
Tridecane	293	54.0	47.8	0.110	2.021	0.756
Tetradecane	293	54.5	47.4	0.108	2.034	0.762
Hexadecane	293	55.2	46.4	0.104	2.046	0.780
1-Tridecene	293	49.3	46.7	0.103	2.139	0.766
1-Tetradecene	293	47.8	46.2	0.102	2.130	0.775
1-Pentadecene	293	47.7	46.3	0.102	2.120	0.775
1-Hexadecene	293	47.5	45.8	0.101	2.130	0.783
Benzene	293	34.1	39.4	0.079	2.283	0.874
Toluene	293	36.1	39.1	0.077	2.379	0.870
o-Xylene	293	37.2	40.3	0.082	2.562	0.879
m-Xylene	293	37.9	39.3	0.078	2.359	0.868
p-Xylene	293	38.6	37.4	0.070	2.274	0.861
Ethylbenzene	293	38.4	38.9	0.076	2.446	0.867
Butylbenzene	293	39.6	39.8	0.079	2.359	0.860
3-Methyl-1-butanol	293	4.8	4.0	0.006	15.63	0.809

1-Butanol	293	1.8	0.5	0.001	17.84	0.810
Isobutanol	293	2.0	1.7	0.003	17.26	0.803
1-Pentanol	293	4.4	4.7	0.007	15.13	0.811
Isoamylol	293	4.8	8.0	0.012	13.71	0.809
1-Hexanol	293	6.8	8.8	0.013	13.03	0.814
1-Heptanol	293	7.7	10.7	0.015	11.75	0.822
1-Octanol	293	8.5	13.7	0.020	10.30	0.827
2-Pentanone	293	6.3	4.4	0.006	15.45	0.809
2-Hexanone	293	9.6	5.8	0.008	14.56	0.812
2-Heptanone	293	12.4	10.5	0.015	11.95	0.820

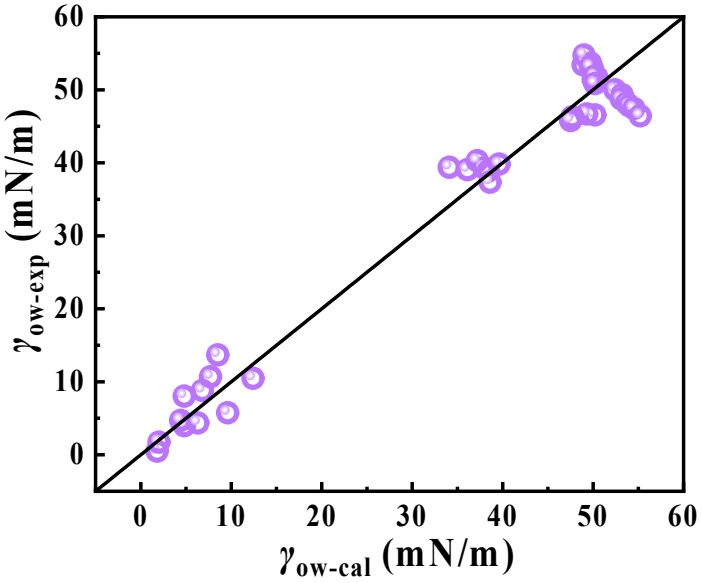

Fig. S1 Correlation between experimental liquid-liquid interfacial tension ($\gamma_{ow\text{-}exp}$) and the calculated ones ($\gamma_{ow\text{-}cal}$) using eqn (15) for 41 binary systems. The symbols represent experimental data, and the solid lines represent the fitting ones.

References

1 J. F. Fu, B. Q. Li and Z. H. Wang, *Chem. Eng. Sci.*, 1986, **41**, 2673–2679.

2 R. David, *Colloids Surf. A*, 2016, **498**, 156–160.

3 D.R. Lide, Hand book of Chemistry and Physics. 84th Edition,CRC Press,Boca Raton, FL. USA. 2003.

4 MACKLIN, Density for some liquids, http://www.macklin.cn.

5 Chemical Book, Dieletric constant and density for some liquids, http://www.chemicalbook.com.