

Supporting information

Measurement and Correlation of the Solubility of Florfenicol Form A in Several Pure and Binary Solvents

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Table S-1. The RD of experimental and calculated solubility values of florfenicol form A in the different pure solvents from $T = (283.15 \text{ to } 323.15) \text{ K}$ at atmospheric pressure

T/K	10^3x_1	$100RD$			
		Modified Apelblat equation	λh equation	NRTL model	Wilson model
ethanol					
283.15	1.510	-4.620	-0.9540	-5.099	-3.838
288.15	1.963	-0.1994	1.594	-0.6938	0.7219
293.15	2.435	-0.237	0.2885	-0.5979	0.8144
298.15	3.093	2.292	1.981	2.283	3.433
303.15	3.695	-1.016	-1.796	-0.5510	0.1510
308.15	4.612	0.2855	-0.5850	1.268	1.199
313.15	5.623	-0.532	-1.199	0.9715	-0.1976
318.15	7.023	1.307	1.120	3.169	0.5449
323.15	8.417	-0.7383	-0.2282	1.357	-3.350
1-propanol					
283.15	0.9742	-2.369	3.553	-6.644	-2.731
288.15	1.245	-3.308	0.05992	-5.837	-2.698
293.15	1.653	-0.1508	1.181	-0.7768	1.340
298.15	2.152	1.306	1.284	2.364	3.381
303.15	2.687	-1.185	-2.018	1.469	1.223
308.15	3.586	3.168	2.095	6.912	5.213
313.15	4.366	-1.327	-2.260	3.327	-0.3028
318.15	5.632	0.1795	-0.1311	4.680	-1.160
323.15	7.122	-0.08174	0.5843	3.086	-5.678
1-butanol					
283.15	0.5123	0.4191	8.296	-3.203	0.5254
288.15	0.6482	-1.591	2.923	-4.410	-1.392
293.15	0.8212	-3.475	-1.660	-5.082	-2.952
298.15	1.120	2.181	2.027	2.082	3.055
303.15	1.398	-1.067	-2.391	0.4664	0.2318
308.15	1.827	0.4089	-1.324	3.401	1.755
313.15	2.358	0.7471	-0.7439	4.920	1.629
318.15	3.016	0.2126	-0.4468	5.163	-0.1194
323.15	3.852	-0.3371	0.3751	4.470	-3.266
2-propanol					
283.15	0.6097	2.005	7.530	-12.62	-0.2285
288.15	0.7605	-2.469	0.8195	-13.79	-3.413
293.15	1.008	-0.5251	0.8303	-7.582	-0.1965
298.15	1.333	1.520	1.560	-1.355	2.842
303.15	1.692	-0.2054	-0.9481	0.9746	1.782
308.15	2.182	-0.08885	-1.122	5.118	1.981
313.15	2.778	-0.9844	-1.868	8.197	0.3771
318.15	3.633	1.128	0.8124	13.77	0.5867
323.15	4.572	-0.3118	0.2737	15.98	-4.550

2-methyl-1-propanol

283.15	0.2932	0.9255	8.072	-9.921	-0.5529
288.15	0.3852	2.194	6.248	-6.576	0.9707
293.15	0.4969	1.821	3.564	-4.539	1.053
298.15	0.6127	-2.959	-2.860	-6.648	-3.168
303.15	0.8192	0.6035	-0.3052	0.2252	0.9622
308.15	1.045	-0.3963	-1.697	2.649	0.373
313.15	1.368	1.259	0.1743	7.745	2.087
318.15	1.703	-1.882	-2.271	8.452	-1.522
323.15	2.239	0.6406	1.423	14.23	-0.3562

3-methyl-1-butanol

283.15	0.4867	0.1679	4.049	-0.1420	1.782
288.15	0.5862	-4.612	-2.449	-5.268	-3.371
293.15	0.7653	-0.8554	-0.1370	-1.480	0.0711
298.15	0.9591	-0.9807	-1.186	-1.325	-0.2208
303.15	1.233	1.667	0.9661	1.818	2.271
308.15	1.492	-1.394	-2.261	-0.5798	-0.9606
313.15	1.910	1.468	0.8058	2.993	1.572
318.15	2.380	1.823	1.616	4.101	1.373
323.15	2.854	-1.341	-0.8552	1.749	-2.755

2-ethyl-1-hexanol

283.15	0.1833	-4.129	0.7452	-6.726	-3.181
288.15	0.2541	3.652	6.165	1.224	4.006
293.15	0.3193	1.965	2.991	-0.1337	2.039
298.15	0.3826	-4.316	-4.344	-5.791	-4.351
303.15	0.5210	2.640	2.013	2.252	2.615
308.15	0.6353	-1.199	-2.051	-0.3404	-1.171
313.15	0.8127	0.0281	-0.6387	2.293	0.0756
318.15	1.026	0.1558	-0.01000	3.942	0.0985
323.15	1.286	-0.0692	0.5399	5.303	-0.4624

propionic

283.15	0.2703	4.188	13.20	1.265	1.300
288.15	0.3470	3.071	8.427	0.2808	0.3784
293.15	0.4475	2.365	4.791	0.1588	0.2501
298.15	0.5621	-0.9787	-0.6818	-2.335	-2.313
303.15	0.7303	-0.9565	-2.024	-1.259	-1.348
308.15	0.9614	0.4088	-1.190	1.076	0.8676
313.15	1.226	-1.395	-2.819	-0.0745	-0.3543
318.15	1.603	-0.5803	-1.108	0.6448	0.4795
323.15	2.105	0.6645	1.611	0.4255	0.8501

Table S-2. The RD of experimental and calculated solubility values of florfenicol form A in DMSO (ω_3) + ethanol($1-\omega_3$) solvents from T= (283.15 to 323.15) K at atmospheric pressure

T/K	10^3x_1	$100RD$	
		Modified Apelblat equation	λh equation
$\omega_3 = 0.000$ ($x_3 = 0.000$)			
283.15	1.510	-4.620	-0.9538
288.15	1.963	-0.1994	1.594
293.15	2.435	-0.2371	0.2885
298.15	3.093	2.292	1.981
303.15	3.695	-1.016	-1.796
308.15	4.612	0.2855	-0.5850
313.15	5.623	-0.5318	-1.199
318.15	7.023	1.306	1.120
323.15	8.417	-0.7383	-0.2282
$\omega_3 = 0.075$ ($x_3 = 0.04562$)			
283.15	3.941	-6.929	-3.117
288.15	5.120	-0.1396	1.660
293.15	6.240	0.2021	0.6973
298.15	7.522	-0.3923	-0.7591
303.15	9.133	-0.1133	-0.9345
308.15	11.23	1.610	0.7181
313.15	13.37	0.2082	-0.4544
318.15	16.35	1.705	1.570
323.15	19.05	-1.504	-0.8672
$\omega_3 = 0.100$ ($x_3 = 0.06148$)			
283.15	6.015	2.103	3.366
288.15	7.033	-1.871	-1.253
293.15	8.630	-0.6194	-0.4881
298.15	10.53	0.4161	0.2545
303.15	12.64	0.2289	-0.0671
308.15	15.06	-0.3078	-0.6071
313.15	18.01	-0.1716	-0.3659
318.15	21.63	0.7218	0.7116
323.15	25.40	-0.3168	-0.0911
$\omega_3 = 0.125$ ($x_3 = 0.07768$)			
283.15	8.563	3.912	7.404
288.15	9.825	0.9859	2.666
293.15	11.42	-0.7260	-0.4406
298.15	13.52	-0.6006	-1.239
303.15	16.01	-0.4286	-1.526
308.15	18.83	-0.9412	-2.082
313.15	22.45	-0.0619	-0.8546
318.15	26.43	-0.4444	-0.5713
323.15	31.56	0.6825	1.495

$\omega_3 = 0.150$ ($x_3 = 0.09424$)

283.15	11.75	4.433	7.414
288.15	12.94	-0.8956	0.5152
293.15	15.26	0.4229	0.5798
298.15	17.53	-0.8663	-1.504
303.15	20.43	-0.7152	-1.728
308.15	23.75	-0.8294	-1.842
313.15	27.81	-0.2464	-0.9183
318.15	32.49	0.0984	0.0494
323.15	37.96	0.4992	1.309

$\omega_3 = 0.200$ ($x_3 = 0.1285$)

283.15	19.22	2.208	4.583
288.15	21.39	-0.2520	0.7678
293.15	24.42	-0.2363	-0.2177
298.15	28.13	0.6255	0.0310
303.15	31.69	-0.7757	-1.650
308.15	36.26	-0.6410	-1.472
313.15	41.41	-0.7091	-1.225
318.15	47.67	-0.01687	0.0164
323.15	54.80	0.5584	1.326

Table S-3. The *RD* of experimental and calculated solubility values of florfenicol form A in DMSO (ω_3) + 1-propanol ($1-\omega_3$) solvents from T= (283.15 to 323.15) K at atmospheric pressure

T/K	10^3x_1	$100RD$	
		Modified Apelblat equation	λh equation
DMSO+1-propanol			
$\omega_3 = 0.000$ ($x_3 = 0.000$)			
283.15	0.9742	-2.369	3.553
288.15	1.245	-3.3085	0.0599
293.15	1.653	-0.1508	1.181
298.15	2.152	1.306	1.284
303.15	2.687	-1.185	-2.018
308.15	3.586	3.168	2.095
313.15	4.366	-1.327	-2.260
318.15	5.632	0.1795	-0.1311
323.15	7.122	-0.08170	0.5843
$\omega_3 = 0.075$ ($x_3 = 0.05870$)			
283.15	2.584	-2.522	2.182
288.15	3.210	-2.026	0.4116
293.15	3.953	-2.322	-1.559
298.15	5.141	2.983	2.628
303.15	6.232	1.442	0.4781
308.15	7.493	-0.8103	-1.946
313.15	9.245	-0.3205	-1.184
318.15	11.47	0.8101	0.5843
323.15	13.86	-0.4945	0.2285
$\omega_3 = 0.100$ ($x_3 = 0.07873$)			
283.15	4.236	1.024	4.242
288.15	5.120	1.700	3.269
293.15	6.046	0.1818	0.5745
298.15	7.126	-1.437	-1.829
303.15	8.754	1.222	0.4528
308.15	10.27	-0.6093	-1.438
313.15	12.16	-1.443	-2.015
318.15	14.75	0.3387	0.2965
323.15	17.56	0.3454	1.036
$\omega_3 = 0.125$ ($x_3 = 0.09899$)			
283.15	6.106	3.854	7.125
288.15	7.003	0.1518	1.740
293.15	8.380	0.6618	0.9329
298.15	9.965	0.5951	0.0184
303.15	11.70	-0.7349	-1.746
308.15	14.02	0.1467	-0.8911
313.15	16.10	-3.310	-4.064
318.15	19.87	0.6235	0.5006

323.15	23.62	0.8516	1.578
$\omega_3 = 0.150$ ($x_3 = 0.1195$)			
283.15	9.348	-2.148	-0.3125
288.15	11.44	2.714	3.435
293.15	13.00	0.2960	0.3009
298.15	15.10	0.1619	-0.2803
303.15	17.66	0.7949	0.1644
308.15	20.16	-0.8652	-1.478
313.15	23.39	-0.7638	-1.160
318.15	27.12	-0.6253	-0.6556
323.15	31.81	0.7834	1.227
$\omega_3 = 0.200$ ($x_3 = 0.1613$)			
283.15	16.10	1.126	3.077
288.15	18.37	1.091	1.890
293.15	20.69	-0.1964	-0.2003
298.15	23.63	-0.0904	-0.5862
303.15	27.13	0.4955	-0.2013
308.15	30.62	-0.5726	-1.230
313.15	34.57	-1.633	-2.033
318.15	40.01	-0.1513	-0.1066
323.15	46.12	0.9229	1.540

Table S-4. The RD of experimental and calculated solubility values of florfenicol form A in DMSO (ω_3) + 1-butanol ($1-\omega_3$) solvents from T= (283.15 to 323.15) K at atmospheric pressure

T/K	10^3x_1	$100RD$	
		Modified Apelblat equation	λh equation
$\omega_3 = 0.000$ ($x_3 = 0.000$)			
283.15	0.5123	0.4191	8.296
288.15	0.6482	-1.591	2.923
293.15	0.8212	-3.475	-1.660
298.15	1.120	2.181	2.027
303.15	1.398	-1.067	-2.391
308.15	1.827	0.4089	-1.324
313.15	2.358	0.7471	-0.7439
318.15	3.016	0.2126	-0.4468
323.15	3.852	-0.3371	0.3751
$\omega_3 = 0.075$ ($x_3 = 0.07142$)			
283.15	2.445	2.502	8.242
288.15	2.988	2.889	5.865
293.15	3.525	-0.2701	0.6746
298.15	4.341	0.7467	0.2535
303.15	5.287	0.5915	-0.6853
308.15	6.219	-3.1023	-4.614
313.15	7.765	-0.7878	-1.893
318.15	9.584	0.3188	0.08080
323.15	11.73	0.5299	1.564
$\omega_3 = 0.100$ ($x_3 = 0.09535$)			
283.15	3.797	7.322	10.92
288.15	4.383	3.584	5.381
293.15	5.035	-0.7389	-0.3523
298.15	6.140	0.8600	0.2807
303.15	7.090	-2.990	-4.099
308.15	8.631	-1.442	-2.596
313.15	10.47	-0.2375	-1.053
318.15	12.26	-2.481	-2.641
323.15	15.37	2.170	2.932
$\omega_3 = 0.125$ ($x_3 = 0.1193$)			
283.15	5.643	2.652	5.207
288.15	6.780	4.123	5.270
293.15	7.573	-1.476	-1.296
298.15	9.108	0.3366	-0.1273
303.15	10.69	-0.1643	-0.9331
308.15	12.36	-2.172	-2.957
313.15	14.65	-1.530	-2.045
318.15	17.54	0.2369	0.2079
323.15	20.76	0.9594	1.578

$\omega_3 = 0.150$ ($x_3 = 0.1434$)

283.15	8.743	0.8829	2.934
288.15	10.25	1.943	2.825
293.15	11.63	-0.2300	-0.1497
298.15	13.56	0.3218	-0.0978
303.15	15.57	-0.5140	-1.156
308.15	18.01	-0.5607	-1.174
313.15	20.61	-1.635	-2.015
318.15	24.33	0.4705	0.5030
323.15	28.12	0.5646	1.131

$\omega_3 = 0.200$ ($x_3 = 0.1917$)

283.15	14.01	3.073	5.143
288.15	15.53	0.4338	1.275
293.15	17.65	0.1628	0.1051
298.15	20.11	0.08600	-0.5174
303.15	22.86	-0.2808	-1.113
308.15	25.70	-1.776	-2.565
313.15	29.56	-0.9547	-1.438
318.15	33.91	-0.4427	-0.4244
323.15	39.38	1.259	1.926
