Industrial & Engineering Chemistry Research

Electronic Supporting Information

Viscosities of 1-iodoalkanes. New experimental data, prediction and analysis.

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Table S1. Experimental densities at atmospheric pressure (P_0 = 0.101 MPa)*

T/K	$\rho/\mathrm{kg\cdot m^{-3}}$	T/K	$\rho/\mathrm{kg\cdot m^{-3}}$	T/K	$\rho/\mathrm{kg\cdot m^{-3}}$	T/K	$\rho/\mathrm{kg\cdot m^{-3}}$	T/K	$\rho/\mathrm{kg\cdot m^{-3}}$
1-iodopentane		**1-iodooctane**		**1-iodononane**		**1-iododecane**		**1-iodododecane**	
255.53	1582.6	298.15	1321.6	298.15	1281.6	298.15	1247.5	297.85	1193.9
262.89	1568.2	293.16	1326.9	293.15	1287.2	293.15	1252.0	293.15	1198.5
272.51	1554.3	283.15	1338.3	283.15	1297.7	283.15	1262.8	283.15	1208.1
282.04	1540.4	273.16	1349.6	273.15	1308.7	273.15	1273.3	323.17	1170.0
291.91	1526.0	263.14	1361.5	263.15	1319.6	263.14	1283.5	343.15	1150.8
296.91	1518.8	253.15	1372.8	253.15	1330.4	253.25	1293.7	363.16	1131.1
301.89	1511.6	363.15	1246.4	323.15	1255.0	323.15	1221.8	383.15	1112.1
322.35	1480.8	393.15	1211.2	343.15	1233.0	343.15	1201.0	393.19	1102.5
342.41	1451.4			363.15	1211.1	363.15	1180.0		
362.97	1421.1			393.15	1178.2	393.18	1148.7		
383.08	1391.3			423.15	1143.7	423.24	1117.2		
403.23	1360.0								

* The standard uncertainty: $u(T)$=0.01 K. The relative standard uncertainties: $u(\rho)$=0.02%

Table S2. The coefficients of Eq. 1 (the lower indices correspond to degrees of the power-law terms) along with the pertinent average absolute deviations.

	$A_2 \cdot 10^3$	A_1	A_0	AAD, %
1-iodopropane	-9.145	-1.330	2216	0.014
1-iodobutane	-7.199	-1.183	2016	0.010
1-iodopentane	0.325	-1.509	1964	0.043
1-iodooctane	-1.215	-1.074	1652	0.013
1-iodononane	-1.892	-0.966	1587	0.018
1-iododecane	-0.733	-0.988	1548	0.011
1-iodododecane	-0.589	-0.920	1473	0.010

Table S3. The coefficients of Eq. 3 along with the pertinent average absolute deviations.

	A	**B**	**C**	**D**	**E**	AAD, %
1-iodopropane	-117.13	3539.1	23.483	-1.6731	0.5	0.17
1-iodobutane	-2422,4	52886	512,5	-39,112	0.5	1.06
1-iodopentane	-889.52	21305	184.55	-13.515	0.5	1.14
1-iodooctane	-359.18	10 435	71.846	-4.8929	0.5	0.17
1-iodononane	-134.15	5233.2	25.339	-1.5567	0.5	0.56
1-iododecane	-450.07	13073	89.925	-6.0822	0.5	0.41
1-iodododecane	-384.03	11924	75.738	-4.9807	0.5	0.12

Table S4. Comparison of the current data with the available literature sources at the atmospheric pressure within the explored temperature interval.

Source of literature values (compilations)	**AAD (%)** Density	**AAD (%)** Viscosity
	1-iodopropane	
Wohlfarth and Wohlfahrt[18]		3.8
	1-iodobutane	
Wohlfarth and Wohlfahrt[18]		6.0
	1-iodopentane	
Frenkel et al.[23]*	0.65	
Frenkel et al.[23]**	0.76	
Wohlfarth and Wohlfahrt[18]		6.4
	1-iodooctane	
Frenkel et al.[23]*	0.36	
Frenkel et al.[23]**	0.36	
Wohlfarth and Wohlfahrt[18]		1.8
	1-iodononane	
Frenkel et al.[23]*	0.30	
Frenkel et al.[23]**	0.30	
	1-iododecane	
Frenkel et al.[23]*	0.29	
Frenkel et al.[23]**	0.31	
Wohlfarth and Wohlfahrt[18]		0.33
	1-iododecane	
Frenkel et al.[23]*	0.22	

* Compilation of raw experimental data. ** Recommended processed value(s).

Table S5 CP-PC-SAFT and PC-SAFT parameters for 1-chloroalkanes.

	CP-PC-SAFT			PC-SAFT		
Compound	m	σ [Å]	ε/k_B [K]	m	σ [Å]	ε/k_B [K]
1-chlorobutane*	3.8331	3.3275	223.76	2.8585	3.6424	258.66
1-chloropentane	4.3093	3.3770	227.46	3.3130	3.6397	256.29
1-chlorohexane	4.7882	3.4139	230.82	3.6250	3.7013	259.53
1-chloroheptane	5.1302	3.4774	235.42	3.8520	3.7887	265.38
1-chlorooctane	5.5432	3.5134	238.00	3.9730	3.8936	273.92
1-chlorononane	5.9761	3.5409	240.04	4.2300	3.9411	277.11
1-chlorodecane	6.4649	3.5529	241.35	4.3210	4.0396	284.08
1-chlorododecane	7.4470	3.5729	243.40	4.9400	4.0682	283.73
1-chlorotetradecane	8.5171	3.5749	244.85	5.2880	4.1657	289.28
1-chlorohexadecane	9.8471	3.5304	244.83	5.8300	4.1999	290.27

* - The PC-SAFT parameters obtained from ref. 39.

Table S6 CP-PC-SAFT and PC-SAFT parameters for 1-iodoalkanes.

	CP-PC-SAFT parameters with T_c and P_c from the Marrero-Morejón and Pardillo-Fontdevila correlation					CP-PC-SAFT parameters with the optimized T_c and P_c					PC-SAFT		
Compound	T_c	P_c	m	σ [Å]	ε/k_B [K]	T_c	P_c	m	σ [Å]	ε/k_B [K]	m	σ [Å]	ε/k_B [K]
iodoethane	554.0	47.11	5.2839	2.7431	208.15	-	-	-	-	-	2.7040	3.3974	271.49
1-iodopropane	586.3	41.52	4.8135	3.0338	226.60	604.9	42.30	4.8818	3.0286	232.79	2.5600	3.7121	295.55
1-iodobutane	614.7	36.86	4.6062	3.2667	240.90	641.3	38.20	4.5155	3.3013	252.94	2.8200	3.8126	298.42
1-iodopentane	640.2	32.95	4.9109	3.3459	245.90	669.9	34.80	4.5094	3.4573	264.33	3.1900	3.8243	294.04
1-iodohexane	662.3	29.63	4.9973	3.4801	253.05	697.4	31.70	4.4525	3.6338	276.32	3.5400	3.8627	291.19
1-iodoheptane	681.8	26.79	5.3397	3.5321	255.36	716.5	28.60	4.8197	3.6708	276.83	3.9800	3.8542	286.48
1-iodooctane	699.4	24.34	5.6712	3.5828	257.40	735.6	25.70	5.3889	3.6586	274.78	4.1500	3.9413	294.32
1-iodononane	715.4	22.21	6.1023	3.6036	257.96	754.6	23.10	6.1605	3.6052	271.39	4.5200	3.9493	291.76
1-iododecane	730.2	20.35	6.5329	3.6231	258.48	769.1	21.10	6.6347	3.6168	271.16	4.8100	3.9832	294.79
1-iodododecane	757.1	17.26	7.5233	3.6312	258.54	792.2	17.90	7.5227	3.6421	270.52	5.2600	4.0743	303.72