Table 1. Calculated and Experimental Critical Temperatures, Volumes, and Pressures of Binary Systems

(Critical pressures are calculated from revised Redlich-Kwong equation)

System	Avg. Dev. in T_{CT}, %	$\frac{2\tau_{12}}{T_{c_1}+T_{c_2}}$	Avg. Dev. in v_{CT}, %	$\frac{2v_{12}}{v_{c_1}+v_{c_2}}$	k_{12}^*	Avg. Dev.† in P_{CT}, %	Ref.
Methane–argon	0.05	0.0044					24
Methane–nitrogen	0.33	0.0198	‡	−0.07	0.03	1.4, 1.7	24, 5, 11
Methane–oxygen	0.51	−0.0400					24
Methane–propane	1.39	0.1237					1a
Methane–propane	0.28	0.1410	1.9	−0.3653			61
Methane–propane	0.39	0.1775			0.02	4.9	50
Methane–*n*-butane	0.81	0.1826	1.4	−0.6975	0.04	5.5	59
Methane–iso-butane	0.45	0.1444	0.3	−0.6503	0.05	3.1	43
Methane–*n*-pentane	0.73	0.2378	3.4	−0.7153	0.06	2.3	62
Methane–iso-pentane	0.02	0.1953			0.07	3.7	2
Methane–*n*-heptane	3.39	0.2773	5.9	−0.9808	0.10	6.8	54
Acetylene–ethane	0.20	−0.0866			0.08	1.8	33
Acetylene–ethylene	0.84	−0.0545			0.06	2.4**	10
Acetylene–propane	0.62	−0.0468			0.09	5.2**	38
Acetylene–propylene	0.17	−0.0304			0.07	5.6**	38
Ethane–propane	0.13	0.0211			0	3.7**	35
Ethane–propylene	0.24	−0.0078	0.4	−0.1057	0	1.3	39
Ethane–*n*-butane	0.13	0.0267	0.8	−0.2753	0.01	1.7	26
Ethane–*n*-pentane	0.73	0.0438	1.0	−0.5250	0.02	3.6**	55
Ethane–cyclohexane	0.47	0.0695	2.9	−0.5931	0.03	3.2**	29
Ethane–*n*-heptane	0.61	0.0743	3.9	−0.6826	0.04	6.0	25
Ethylene–ethane	0.17	0.0006					37
Ethylene–propylene	0.14	0.0241					23
Ethylene–*n*-heptane	0.69	0.0799	4.8	−0.8327	0.04	10.9	28
Propane–*n*-butane	0.12	0.0144	1.3	−0.0061	0	1.1	41
Propane–*n*-pentane	0.14	0.0092			0.01	1.1**	60
Propane–iso-pentane	0.06	0.0088	1.1	−0.2991	0	1.4	65
n-Butane–nitrogen	1.80	0.3500	‡	−0.95	0.12	4.0	57
n-Butane–*n*-heptane	0.03	0.0192	1.9	−0.3042	0	1.1	27
n-Pentane–neo-pentane	0.02	0.0038					46
n-Pentane–*n*-hexane	0.06	0.0031					46
n-Pentane–cyclohexane	0.03	0.0201					46
n-Pentane–*n*-heptane	0.05	0.0076			0	1.4	13
neo-Pentane–*n*-hexane	0.09	0.0064					46
neo-Pentane–cyclohexane	0.05	0.0047					46
n-Hexane–cyclohexane	0.03	0.0013					46
Benzene–ethane	0.82	0.0526	3.8	−0.5588	0.03	2.6**	31
Benzene–propane	1.16	0.0264			0.02	2.0	20
Benzene–*n*-pentane	0.71	−0.0066					46
Benzene–neo-pentane	0.44	−0.0258					46
Benzene–*n*-hexane	0.14	−0.0182					46
Benzene–cyclohexane	0.01	−0.0128					46
Benzene–toluene	0.03	0.0008					46
Toluene–*n*-pentane	0.14	−0.0302					46
Toluene–*n*-hexane	0.09	−0.0028	0.0	−0.1141			46, 66
Toluene–cyclohexane	0.04	−0.0061					46
Carbon dioxide–methane	1.61	0.0472			0.07	2.4	15
Carbon dioxide–ethane	0.10	−0.0911					33
Carbon dioxide–propane	0.99	−0.0573			0.10	6.5	48
Carbon dioxide–propane	0.67	−0.0693	3.0	−0.3418			52
Carbon dioxide–*n*-butane	0.91	−0.0313					48
Carbon dioxide–*n*-butane	0.74	−0.0707	1.0	−0.4513	0.18	7.0	42
Carbon dioxide–*n*-pentane	2.42	0.0156					48
Carbon monoxide–argon	0.13	−0.0015					24
Carbon monoxide–oxygen	0.07	−0.0005					24
Carbon monoxide–nitrogen	0.06	−0.0054					24
Carbon monoxide–methane	0.16	0.0220					24
Carbon monoxide–propane	0.20	0.3560					67
Hydrogen sulfide–methane	0.84	0.0577	2.7	−0.6063	0.06	1.6	51
Hydrogen sulfide–ethane	0.36	−0.0683	0.5	−0.1279	0.06	1.7	30
Hydrogen sulfide–propane	0.04	−0.0748	1.0	−0.1746	0.08	1.2	32
Hydrogen sulfide–*n*-pentane	1.75	−0.0168¶	2.1	−0.5030	0.10	9.1	53
Hydrogen sulfide–carbon dioxide	0.14	−0.0666	0.8	−0.0760	0.08	2.1	4
Nitrogen–argon	0.08	0.0098					24
Nitrogen–oxygen	0.05	0.0163					24
Argon–oxygen	0.03	−0.0090					24

*Values of k_{12} are obtained from second virial coefficient (B_{12}) data or saturated liquid volume data of binary mixtures.
†In calculating v_{CT} and T_{CT} values of τ_{12} and v_{12} were taken from this table unless otherwise noted.
‡No critical volumes of mixtures available for these systems. Values of v_{12} are back-calculated from critical pressure of mixture.
**Value of v_{12} for these systems were taken from the smoothed curves of Figure 4.
¶This parameter does not follow the trend of other hydrogen sulfide-paraffin systems shown in Figure 2.