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**Table 1**

<b>Component</b>	<b><math>m</math></b>	<b><math>\sigma</math> (Å)</b>	<b><math>\varepsilon/k</math> (K)</b>	<b><math>\frac{\varepsilon^{A_i B_i}}{k}</math> (K)</b>	<b><math>\kappa^{A_i B_i}</math></b>	<b>AAD (%) <math>p^{sat}</math></b>	<b>AAD (%) <math>\rho^{sat}</math></b>	<b>T range (K)</b>	<b>Ref.</b>
H <sub>2</sub> O	1.00	3.04	204.7	1920.02	0.0425	2.7	5.9	273-582	<sup>44</sup>
CH <sub>4</sub>	1.00	3.7039	150.03			0.4	0.7	97-300	<sup>41</sup>
CO <sub>2</sub>	2.0729	2.7852	169.21			2.8	2.7	216-304	<sup>41</sup>
H <sub>2</sub> S	1.6686	3.0349	229.00			0.4	0.6	187-362	<sup>53</sup>
N <sub>2</sub>	1.2053	3.3130	90.96			0.3	1.5	63-126	<sup>41</sup>
Ar	0.9285	3.4784	122.23			0.3	0.7	84-151	<sup>41</sup>
N <sub>2</sub> O	2.3547	2.6699	160.85			3.0	1.8	182-278	This work

**Table 2**

	<b>Association sites on acid gas</b>	$\frac{\varepsilon^{A_i B_j}}{k}$ (K)	$\kappa^{A_i B_j}$ (fitted)
H <sub>2</sub> O-CO <sub>2</sub>	2 electron acceptor	1683.813	0.0066
H <sub>2</sub> O-H <sub>2</sub> S	2 electron donor	1308.323	0.041

**Table 3**

<b><i>T</i> (K)</b>	<b><i>p</i> (MPa)</b>	<b>C1 (mol. %)</b>	<b>C<sub>2</sub> (mol. %)</b>	<b>CO<sub>2</sub> (mol. %)</b>	<b>H<sub>2</sub>O (mol. %)</b>
314.82	3.45	90		10	0.269
314.82	6.89	90		10	0.137
314.82	20.68	90		10	0.087
314.82	41.37	90		10	0.078
314.82	62.05	90		10	0.072
314.82	75.84	90		10	0.059
314.82	89.63	90		10	0.059
314.82	96.53	90		10	0.055
314.82	103.42	90		10	0.054
365.98	3.45	90		10	2.650
365.98	6.89	90		10	1.390
365.98	20.68	90		10	0.690
365.98	41.37	90		10	0.549
365.98	62.05	90		10	0.432
365.98	75.84	90		10	0.431
365.98	89.63	90		10	0.349
365.98	96.53	90		10	0.340
365.98	103.42	90		10	0.332
420.98	3.45	90		10	15.400
420.98	6.89	90		10	7.950
420.98	20.68	90		10	3.330
420.98	41.37	90		10	2.250
420.98	62.05	90		10	1.980
420.98	75.84	90		10	1.710
420.98	89.63	90		10	1.640
420.98	96.53	90		10	1.490
420.98	103.42	90		10	1.480
462.98	3.45	90		10	35.400
462.98	6.89	90		10	21.300
462.98	20.68	90		10	8.080
462.98	41.37	90		10	5.700
462.98	62.05	90		10	4.810
462.98	75.84	90		10	4.380
462.98	89.63	90		10	3.900
462.98	96.53	90		10	3.800
462.98	103.42	90		10	3.650

315.98	1.72		5	95	0.569
315.98	3.45		5	95	0.351
315.98	6.89		5	95	0.270
315.98	9.22		5	95	0.274
315.98	14.35		5	95	0.310
315.98	41.37		5	95	0.350
315.98	89.63		5	95	0.340
363.98	1.72		5	95	4.296
363.98	3.45		5	95	2.667
363.98	6.89		5	95	1.632
363.98	8.62		5	95	1.421
363.98	13.44		5	95	1.340
363.98	41.37		5	95	1.430
363.98	89.63		5	95	1.440
422.59	2.87		5	95	21.260
422.59	6.89		5	95	9.400
422.59	13.79		5	95	5.200
422.59	20.68		5	95	5.150
422.59	24.13		5	95	5.290
422.59	41.37		5	95	5.200
422.59	89.63		5	95	5.200
304.26	3.45	30		70	0.182
304.26	6.89	30		70	0.129
315.93	13.79	30		70	0.228
315.93	20.68	30		70	0.260
333.15	20.68	30		70	0.437
333.15	31.54	30		70	0.528
366.48	5.00	30		70	1.831
366.48	7.24	30		70	1.475
366.48	10.00	30		70	1.189
366.48	15.00	30		70	1.096
366.48	20.68	30		70	1.100
366.48	31.54	30		70	1.199

473.15	15.00	30		70	12.530
473.15	20.68	30		70	11.830
473.15	31.54	30		70	10.590

**Table 4**

<b>System</b>	<b><math>k_{ij}</math></b>	<b>%AAD <math>p^{bubb}</math></b>	<b>%AAD <math>y</math></b>	<b>ref</b>
CH <sub>4</sub> -CO <sub>2</sub>	0.046	2.163	6.939	<sup>71</sup>
CH <sub>4</sub> -H <sub>2</sub> S	0.055	2.681	2.712	<sup>72</sup>
CO <sub>2</sub> -H <sub>2</sub> S	0.062	2.481	2.509	<sup>73</sup>

**Table 5**

<b>Conditions</b>			<b>Water Content, lb/MMCF</b>					
<b>Temp. (K)</b>	<b>Pressure (MPa)</b>	<b>H<sub>2</sub>S Conc. (mol. %)</b>	<b>Exper.</b>	<b>McKetta</b>	<b>AQUA.</b>	<b>Wichert</b>	<b>B-M</b>	<b>PC-SAFT</b>
344.26	9.62	16	226	220	235	231	260	204
344.26	6.96	17	292	280	294	294	322	260
344.26	4.21	19	442	410	435	418	467	399
344.26	2.47	21	712	700	692	707	723	652
344.26	9.60	27.5	247	220	255	264	297	211
344.26	6.38	29	328	300	329	330	375	284

**Table 6**

Conditions			Water Content, lb/MMCF			
Mixture	Temp. (K)	Pressure (MPa)	Exper.	AQUA.	B-M	PC-SAFT
20% CO <sub>2</sub> /80% C <sub>1</sub>	310.93	13.79	40.6	46	40.7	38.2
20% CO <sub>2</sub> /80% C <sub>1</sub>	344.26	6.89	282	293	295	261.3
11% CO <sub>2</sub> /89% C <sub>1</sub>	310.93	13.79	40.6	42	39.4	35.8
11% CO <sub>2</sub> /89% C <sub>1</sub>	344.26	6.89	286	284	287	258.6
5.31% C <sub>1</sub> /94.69% CO <sub>2</sub>	298.15	10.34	109.2	126.3	27.2	126.4
5.31% C <sub>1</sub> /94.69% CO <sub>2</sub>	323.15	13.79	164.6	235.6	100	163.3
27.5% H <sub>2</sub> S/72.5% C <sub>1</sub>	344.26	9.43	247	258	300	213.8
17% H <sub>2</sub> S/83% C <sub>1</sub>	344.26	6.89	292	296	325	262.5
8% H <sub>2</sub> S/92% C <sub>1</sub>	327.59	10.34	111	105	113	92.3

**Table 7**

<b>CH<sub>4</sub></b>	<b>H<sub>2</sub>O</b>	<b>CO<sub>2</sub></b>	<b>H<sub>2</sub>S</b>	<b>T (K)</b>	<b>p (MPa)</b>	<b>y<sub>exp</sub><sup>75</sup></b>	<b>%AD</b>
0.15	0.50	0.30	0.05	310.95	4.82	0.00191	9.92
0.15	0.50	0.30	0.05	310.95	7.6	0.00171	21.57
0.15	0.50	0.30	0.05	310.95	12.52	0.00187	13.65
0.15	0.50	0.30	0.05	310.95	16.93	0.00199	9.94
0.15	0.50	0.30	0.05	380.35	8.36	0.0225	16.81
0.15	0.50	0.30	0.05	380.35	12.93	0.0196	28.27
0.15	0.50	0.30	0.05	380.35	17.17	0.0179	30.28
0.15	0.50	0.30	0.05	449.85	11.8	0.095	2.24
0.15	0.50	0.30	0.05	449.85	17.31	0.0848	12.80
0.05	0.49	0.05	0.41	380.35	7.56	0.0253	16.73
0.05	0.49	0.05	0.41	380.35	12.27	0.0264	28.39
0.05	0.49	0.05	0.41	380.35	16.92	0.0295	11.00
0.05	0.49	0.05	0.41	449.85	11	0.0938	12.06
0.05	0.49	0.05	0.41	449.85	18.17	0.113	27.67
<b>%AAD</b>							<b>17.24</b>