






1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>		Case Name: BINAK WINTER-D03.hsc		
2			Unit Set: Binak3a1314		
3					
4			Date/Time: Mon Mar 7 12:14:35 2022		
5					
6	Material Stream: 01			Fluid Package:	Basis-1
7				Property Package:	Peng-Robinson
8					
9	CONDITIONS				
10					
11		Overall	Vapour Phase		
12	Vapour / Phase Fraction	1.0000	1.0000		
13	Temperature: (C)	26.67	26.67		
14	Pressure: (bar_g)	5.500	5.500		
15	Molar Flow (MMSCFD)	5.000	5.000		
16	Mass Flow (kg/h)	5071	5071		
17	Std Ideal Liq Vol Flow (m3/h)	14.69	14.69		
18	Molar Enthalpy (kJ/kgmole)	-8.337e+004	-8.337e+004		
19	Molar Entropy (kJ/kgmole-C)	174.5	174.5		
20	Heat Flow (kW)	-5768	-5768		
21	Liq Vol Flow @Std Cond (m3/h)	5866 *	5866		
22	PROPERTIES				
23					
24		Overall	Vapour Phase		
25	Molecular Weight	20.36	20.36		
26	Molar Density (kgmole/m3)	0.2671	0.2671		
27	Mass Density (kg/m3)	5.439	5.439		
28	Act. Volume Flow (m3/h)	932.3	932.3		
29	Mass Enthalpy (kJ/kg)	-4095	-4095		
30	Mass Entropy (kJ/kg-C)	8.571	8.571		
31	Heat Capacity (kJ/kgmole-C)	41.55	41.55		
32	Mass Heat Capacity (kJ/kg-C)	2.040	2.040		
33	LHV Molar Basis (Std) (kJ/kgmole)	9.338e+005	9.338e+005		
34	HHV Molar Basis (Std) (kJ/kgmole)	1.024e+006	1.024e+006		
35	HHV Mass Basis (Std) (kJ/kg)	5.027e+004	5.027e+004		
36	CO2 Loading	---	---		
37	CO2 Apparent Mole Conc. (kgmole/m3)	---	---		
38	CO2 Apparent Wt. Conc. (kgmol/kg)	---	---		
39	LHV Mass Basis (Std) (kJ/kg)	4.586e+004	4.586e+004		
40	Phase Fraction [Vol. Basis]	1.000	1.000		
41	Phase Fraction [Mass Basis]	1.000	1.000		
42	Phase Fraction [Act. Vol. Basis]	1.000	1.000		
43	Mass Exergy (kJ/kg)	224.2	---		
44	Partial Pressure of CO2 (bar_g)	-0.9044	---		
45	Cost Based on Flow (Cost/s)	0.0000	0.0000		
46	Act. Gas Flow (ACT_m3/h)	932.3	932.3		
47	Avg. Liq. Density (kgmole/m3)	16.96	16.96		
48	Specific Heat (kJ/kgmole-C)	41.55	41.55		
49	Std. Gas Flow (Nm3/h)	5582	5582		
50	Std. Ideal Liq. Mass Density (kg/m3)	345.3	345.3		
51	Act. Liq. Flow (m3/s)	---	---		
52	Z Factor	0.9781	0.9781		
53	Watson K	17.99	17.99		
54	User Property	---	---		
55	Partial Pressure of H2S (bar_g)	-0.8916	---		
56	Cp/(Cp - R)	1.250	1.250		
57	Cp/Cv	1.281	1.281		
58	Heat of Vap. (kJ/kgmole)	1.550e+004	---		
59	Kinematic Viscosity (cSt)	2.069	2.069		
60	Liq. Mass Density (Std. Cond) (kg/m3)	0.8645	0.8645		
61	Liq. Vol. Flow (Std. Cond) (m3/h)	5866	5866		
62	Liquid Fraction	0.0000	0.0000		
63	Molar Volume (m3/kgmole)	3.743	3.743		
64	Mass Heat of Vap. (kJ/kg)	761.3	---		
65	Phase Fraction [Molar Basis]	1.0000	1.0000		
66	Surface Tension (dyne/cm)	---	---		
67	Thermal Conductivity (W/m-K)	3.062e-002	3.062e-002		
68	Viscosity (cP)	1.125e-002	1.125e-002		
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 1 of 39				


1	 <div> <div>Company Name Not Available</div> <div>Bedford, MA</div> <div>USA</div> </div>			Case Name: BINAK WINTER-D03.hsc		
2				Unit Set: Binak3a1314		
3				Date/Time: Mon Mar 7 12:14:35 2022		
4						
5	Material Stream: 01 (continued)				Fluid Package: Basis-1	
6					Property Package: Peng-Robinson	
7						
8	PROPERTIES					
9						
10						
11		Overall	Vapour Phase			
12	Cv (Semi-Ideal) (kJ/kgmole-C)	33.23	33.23			
13	Mass Cv (Semi-Ideal) (kJ/kg-C)	1.632	1.632			
14	Cv (kJ/kgmole-C)	32.43	32.43			
15	Mass Cv (kJ/kg-C)	1.593	1.593			
16	Cv (Ent. Method) (kJ/kgmole-C)	---	---			
17	Mass Cv (Ent. Method) (kJ/kg-C)	---	---			
18	Cp/Cv (Ent. Method)	---	---			
19	Reid VP at 37.8 C (bar_g)	---	---			
20	True VP at 37.8 C (bar_g)	---	---			
21	Liq. Vol. Flow - Sum(Std. Cond) (m3/h)	5866	5866			
22	Viscosity Index	-16.18	---			
23	Ideal Gas Cp/Cv	1.257	1.257			
24	Ideal Gas Cp (kJ/kgmole-C)	40.64	40.64			
25	Mass Ideal Gas Cp (kJ/kg-C)	1.996	1.996			
26	Bubble Point Pressure (bar_g)	---	---			
27	COMPOSITION					
28						
29						
30	Overall Phase			Vapour Fraction	1.0000	
31	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)
32						LIQUID VOLUME FRACTION
33	H2O	1.3532	0.0054	24.3779	0.0048	0.0244
34	CO2	4.1633	0.0167	183.2244	0.0361	0.2220
35	H2S	4.6511	0.0187	158.4916	0.0313	0.2010
36	Methane	195.1936	0.7837	3131.4719	0.6175	10.4594
37	Ethane	29.5264	0.1186	887.8561	0.1751	2.4962
38	Propane	10.5078	0.0422	463.3609	0.0914	0.9145
39	i-Butane	0.8163	0.0033	47.4465	0.0094	0.0844
40	n-Butane	1.7629	0.0071	102.4643	0.0202	0.1757
41	i-Pentane	0.3218	0.0013	23.2185	0.0046	0.0372
42	n-Pentane	0.1959	0.0008	14.1330	0.0028	0.0224
43	n-Hexane	0.2343	0.0009	20.1900	0.0040	0.0305
44	n-Heptane	0.0604	0.0002	6.0570	0.0012	0.0088
45	n-Octane	0.0133	0.0001	1.5143	0.0003	0.0021
46	n-Nonane	0.0039	0.0000	0.5048	0.0001	0.0007
47	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000
48	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000
49	Nitrogen	0.2523	0.0010	7.0665	0.0014	0.0088
50	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000
51	Total	249.0564	1.0000	5071.3779	1.0000	14.6882
52						
53	Vapour Phase			Phase Fraction	1.000	
54	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)
55						LIQUID VOLUME FRACTION
56	H2O	1.3532	0.0054	24.3779	0.0048	0.0244
57	CO2	4.1633	0.0167	183.2244	0.0361	0.2220
58	H2S	4.6511	0.0187	158.4916	0.0313	0.2010
59	Methane	195.1936	0.7837	3131.4719	0.6175	10.4594
60	Ethane	29.5264	0.1186	887.8561	0.1751	2.4962
61	Propane	10.5078	0.0422	463.3609	0.0914	0.9145
62	i-Butane	0.8163	0.0033	47.4465	0.0094	0.0844
63	n-Butane	1.7629	0.0071	102.4643	0.0202	0.1757
64	i-Pentane	0.3218	0.0013	23.2185	0.0046	0.0372
65	n-Pentane	0.1959	0.0008	14.1330	0.0028	0.0224
66	n-Hexane	0.2343	0.0009	20.1900	0.0040	0.0305
67	n-Heptane	0.0604	0.0002	6.0570	0.0012	0.0088
68	n-Octane	0.0133	0.0001	1.5143	0.0003	0.0021
69						


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5					Date/Time: Mon Mar 7 12:14:35 2022		
6	Material Stream: 01 (continued)					Fluid Package: Basis-1	
7						Property Package: Peng-Robinson	
8							
9	COMPOSITION						
10							
11	Vapour Phase (continued)					Phase Fraction 1.000	
12							
13	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION
14							
15	n-Nonane	0.0039	0.0000	0.5048	0.0001	0.0007	0.0000
16	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
17	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
18	Nitrogen	0.2523	0.0010	7.0665	0.0014	0.0088	0.0006
19	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20	Total	249.0564	1.0000	5071.3779	1.0000	14.6882	1.0000
21	Material Stream: 02					Fluid Package: Basis-1	
22						Property Package: Peng-Robinson	
23							
24	CONDITIONS						
25							
26		Overall	Vapour Phase				
27	Vapour / Phase Fraction	1.0000	1.0000				
28	Temperature: (C)	15.50	15.50				
29	Pressure: (bar_g)	5.500	5.500				
30	Molar Flow (MMSCFD)	9.600	9.600				
31	Mass Flow (kg/h)	1.061e+004	1.061e+004				
32	Std Ideal Liq Vol Flow (m3/h)	28.30	28.30				
33	Molar Enthalpy (kJ/kgmole)	-8.579e+004	-8.579e+004				
34	Molar Entropy (kJ/kgmole-C)	174.3	174.3				
35	Heat Flow (kW)	-1.139e+004	-1.139e+004				
36	Liq Vol Flow @Std Cond (m3/h)	1.126e+004 *	1.126e+004				
37	PROPERTIES						
38							
39		Overall	Vapour Phase				
40	Molecular Weight	22.18	22.18				
41	Molar Density (kgmole/m3)	0.2791	0.2791				
42	Mass Density (kg/m3)	6.190	6.190				
43	Act. Volume Flow (m3/h)	1713	1713				
44	Mass Enthalpy (kJ/kg)	-3868	-3868				
45	Mass Entropy (kJ/kg-C)	7.857	7.857				
46	Heat Capacity (kJ/kgmole-C)	42.00	42.00				
47	Mass Heat Capacity (kJ/kg-C)	1.894	1.894				
48	LHV Molar Basis (Std) (kJ/kgmole)	9.392e+005	9.392e+005				
49	HHV Molar Basis (Std) (kJ/kgmole)	1.028e+006	1.028e+006				
50	HHV Mass Basis (Std) (kJ/kg)	4.634e+004	4.634e+004				
51	CO2 Loading	---	---				
52	CO2 Apparent Mole Conc. (kgmole/m3)	---	---				
53	CO2 Apparent Wt. Conc. (kgmol/kg)	---	---				
54	LHV Mass Basis (Std) (kJ/kg)	4.234e+004	4.234e+004				
55	Phase Fraction [Vol. Basis]	1.000	1.000				
56	Phase Fraction [Mass Basis]	1.000	1.000				
57	Phase Fraction [Act. Vol. Basis]	1.000	1.000				
58	Mass Exergy (kJ/kg)	205.9	---				
59	Partial Pressure of CO2 (bar_g)	-0.8203	---				
60	Cost Based on Flow (Cost/s)	0.0000	0.0000				
61	Act. Gas Flow (ACT_m3/h)	1713	1713				
62	Avg. Liq. Density (kgmole/m3)	16.89	16.89				
63	Specific Heat (kJ/kgmole-C)	42.00	42.00				
64	Std. Gas Flow (Nm3/h)	1.072e+004	1.072e+004				
65	Std. Ideal Liq. Mass Density (kg/m3)	374.7	374.7				
66	Act. Liq. Flow (m3/s)	---	---				
67	Z Factor	0.9724	0.9724				
68	Watson K	16.84	16.84				
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 3 of 39						


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2				Unit Set: Binak3a1314					
3									
4				Date/Time: Mon Mar 7 12:14:35 2022					
5	<div>Material Stream: 02 (continued)</div>								
6								Fluid Package: Basis-1	
7								Property Package: Peng-Robinson	
8									
9	PROPERTIES								
10									
11		Overall	Vapour Phase						
12	User Property	---	---						
13	Partial Pressure of H2S (bar_g)	-0.6105	---						
14	Cp/(Cp - R)	1.247	1.247						
15	Cp/Cv	1.284	1.284						
16	Heat of Vap. (kJ/kgmole)	1.572e+004	---						
17	Kinematic Viscosity (cSt)	1.768	1.768						
18	Liq. Mass Density (Std. Cond) (kg/m3)	0.9421	0.9421						
19	Liq. Vol. Flow (Std. Cond) (m3/h)	1.126e+004	1.126e+004						
20	Liquid Fraction	0.0000	0.0000						
21	Molar Volume (m3/kgmole)	3.583	3.583						
22	Mass Heat of Vap. (kJ/kg)	708.7	---						
23	Phase Fraction [Molar Basis]	1.0000	1.0000						
24	Surface Tension (dyne/cm)	---	---						
25	Thermal Conductivity (W/m-K)	2.781e-002	2.781e-002						
26	Viscosity (cP)	1.094e-002	1.094e-002						
27	Cv (Semi-Ideal) (kJ/kgmole-C)	33.69	33.69						
28	Mass Cv (Semi-Ideal) (kJ/kg-C)	1.519	1.519						
29	Cv (kJ/kgmole-C)	32.72	32.72						
30	Mass Cv (kJ/kg-C)	1.475	1.475						
31	Cv (Ent. Method) (kJ/kgmole-C)	---	---						
32	Mass Cv (Ent. Method) (kJ/kg-C)	---	---						
33	Cp/Cv (Ent. Method)	---	---						
34	Reid VP at 37.8 C (bar_g)	---	---						
35	True VP at 37.8 C (bar_g)	---	---						
36	Liq. Vol. Flow - Sum(Std. Cond) (m3/h)	1.126e+004	1.126e+004						
37	Viscosity Index	-19.09	---						
38	Ideal Gas Cp/Cv	1.255	1.255						
39	Ideal Gas Cp (kJ/kgmole-C)	40.91	40.91						
40	Mass Ideal Gas Cp (kJ/kg-C)	1.845	1.845						
41	Bubble Point Pressure (bar_g)	166.1	---						
42	COMPOSITION								
43									
44									
45	Overall Phase				Vapour Fraction		1.0000		
46	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION		
47									
48	H2O	1.3105	0.0027	23.6086	0.0022	0.0237	0.0008		
49	CO2	14.1637	0.0296	623.3421	0.0588	0.7553	0.0267		
50	H2S	29.5674	0.0618	1007.5391	0.0950	1.2779	0.0452		
51	Methane	342.7912	0.7169	5499.3651	0.5185	18.3683	0.6490		
52	Ethane	53.5552	0.1120	1610.3985	0.1518	4.5276	0.1600		
53	Propane	23.9401	0.0501	1055.6851	0.0995	2.0835	0.0736		
54	i-Butane	2.0506	0.0043	119.1916	0.0112	0.2121	0.0075		
55	n-Butane	4.1490	0.0087	241.1550	0.0227	0.4135	0.0146		
56	i-Pentane	1.9076	0.0040	137.6334	0.0130	0.2208	0.0078		
57	n-Pentane	0.8584	0.0018	61.9350	0.0058	0.0984	0.0035		
58	n-Hexane	1.3830	0.0029	119.1833	0.0112	0.1799	0.0064		
59	n-Heptane	0.3338	0.0007	33.4510	0.0032	0.0487	0.0017		
60	n-Octane	0.0954	0.0002	10.8953	0.0010	0.0154	0.0005		
61	n-Nonane	0.0477	0.0001	6.1166	0.0006	0.0085	0.0003		
62	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
63	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
64	Nitrogen	2.0030	0.0042	56.1087	0.0053	0.0696	0.0025		
65	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
66	Total	478.1565	1.0000	10605.6086	1.0000	28.3031	1.0000		
67									
68									
69	Aspen Technology Inc.		Aspen HYSYS Version 11			Page 4 of 39			


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3							
4							
5	<div>Date/Time: Mon Mar 7 12:14:35 2022</div>						
6							
7							
8	<div>Material Stream: 02 (continued)</div>			Fluid Package: Basis-1			
9				Property Package: Peng-Robinson			
10							
11	COMPOSITION						
12	Vapour Phase						
13	Phase Fraction 1.000						
14	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION
15	H2O	1.3105	0.0027	23.6086	0.0022	0.0237	0.0008
16	CO2	14.1637	0.0296	623.3421	0.0588	0.7553	0.0267
17	H2S	29.5674	0.0618	1007.5391	0.0950	1.2779	0.0452
18	Methane	342.7912	0.7169	5499.3651	0.5185	18.3683	0.6490
19	Ethane	53.5552	0.1120	1610.3985	0.1518	4.5276	0.1600
20	Propane	23.9401	0.0501	1055.6851	0.0995	2.0835	0.0736
21	i-Butane	2.0506	0.0043	119.1916	0.0112	0.2121	0.0075
22	n-Butane	4.1490	0.0087	241.1550	0.0227	0.4135	0.0146
23	i-Pentane	1.9076	0.0040	137.6334	0.0130	0.2208	0.0078
24	n-Pentane	0.8584	0.0018	61.9350	0.0058	0.0984	0.0035
25	n-Hexane	1.3830	0.0029	119.1833	0.0112	0.1799	0.0064
26	n-Heptane	0.3338	0.0007	33.4510	0.0032	0.0487	0.0017
27	n-Octane	0.0954	0.0002	10.8953	0.0010	0.0154	0.0005
28	n-Nonane	0.0477	0.0001	6.1166	0.0006	0.0085	0.0003
29	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
31	Nitrogen	2.0030	0.0042	56.1087	0.0053	0.0696	0.0025
32	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
33	Total	478.1565	1.0000	10605.6086	1.0000	28.3031	1.0000
34	<div>Material Stream: 03</div>			Fluid Package: Basis-1			
35				Property Package: Peng-Robinson			
36							
37	CONDITIONS						
38							
39		Overall	Vapour Phase	Aqueous Phase			
40	Vapour / Phase Fraction	0.9999	0.9999	0.0001			
41	Temperature: (C)	19.23	19.23	19.23			
42	Pressure: (bar_g)	5.300	5.300	5.300			
43	Molar Flow (MMSCFD)	14.60	14.60	1.319e-003			
44	Mass Flow (kg/h)	1.568e+004	1.568e+004	1.184			
45	Std Ideal Liq Vol Flow (m3/h)	42.99	42.99	1.187e-003			
46	Molar Enthalpy (kJ/kgmole)	-8.496e+004	-8.494e+004	-2.865e+005			
47	Molar Entropy (kJ/kgmole-C)	174.7	174.7	52.26			
48	Heat Flow (kW)	-1.716e+004	-1.716e+004	-5.229			
49	Liq Vol Flow @Std Cond (m3/h)	1.712e+004 *	1.712e+004	1.167e-003			
50	PROPERTIES						
51							
52		Overall	Vapour Phase	Aqueous Phase			
53	Molecular Weight	21.56	21.56	18.02			
54	Molar Density (kgmole/m3)	0.2663	0.2663	56.13			
55	Mass Density (kg/m3)	5.741	5.741	1012			
56	Act. Volume Flow (m3/h)	2731	2731	1.170e-003			
57	Mass Enthalpy (kJ/kg)	-3941	-3940	-1.590e+004			
58	Mass Entropy (kJ/kg-C)	8.103	8.103	2.899			
59	Heat Capacity (kJ/kgmole-C)	41.81	41.81	77.70			
60	Mass Heat Capacity (kJ/kg-C)	1.940	1.939	4.311			
61	LHV Molar Basis (Std) (kJ/kgmole)	9.374e+005	9.375e+005	247.6			
62	HHV Molar Basis (Std) (kJ/kgmole)	1.026e+006	1.027e+006	4.125e+004			
63	HHV Mass Basis (Std) (kJ/kg)	4.761e+004	4.762e+004	2289			
64	CO2 Loading	---	---	---			
65	CO2 Apparent Mole Conc. (kgmole/m3)	---	---	4.777e-003			
66	CO2 Apparent Wt. Conc. (kgmol/kg)	---	---	4.721e-006			
67	LHV Mass Basis (Std) (kJ/kg)	4.348e+004	4.349e+004	13.74			
68	Phase Fraction [Vol. Basis]	1.000	1.000	2.761e-005			
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 5 of 39						


1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>			Case Name: BINAK WINTER-D03.hsc			
2				<div>Unit Set: Binak3a1314</div>			
3							
4							
5				Date/Time: Mon Mar 7 12:14:35 2022			
6	<div>Material Stream: 03 (continued)</div>			Fluid Package: Basis-1			
7				<div>Property Package: Peng-Robinson</div>			
8							
9							
10	PROPERTIES						
11		Overall	Vapour Phase	Aqueous Phase			
12	Phase Fraction [Mass Basis]	0.9999	0.9999	7.553e-005			
13	Phase Fraction [Act. Vol. Basis]	1.000	1.000	4.286e-007			
14	Mass Exergy (kJ/kg)	208.2	---	---			
15	Partial Pressure of CO2 (bar_g)	-0.8541	---	---			
16	Cost Based on Flow (Cost/s)	0.0000	0.0000	0.0000			
17	Act. Gas Flow (ACT_m3/h)	2731	2731	---			
18	Avg. Liq. Density (kgmole/m3)	16.92	16.91	55.35			
19	Specific Heat (kJ/kgmole-C)	41.81	41.81	77.70			
20	Std. Gas Flow (Nm3/h)	1.630e+004	1.630e+004	1.472			
21	Std. Ideal Liq. Mass Density (kg/m3)	364.7	364.6	997.7			
22	Act. Liq. Flow (m3/s)	3.251e-007	---	3.251e-007			
23	Z Factor	---	0.9752	4.627e-003			
24	Watson K	17.21	17.21	9.080			
25	User Property	---	---	---			
26	Partial Pressure of H2S (bar_g)	-0.7162	---	---			
27	Cp/(Cp - R)	1.248	1.248	1.120			
28	Cp/Cv	1.282	1.282	1.143			
29	Heat of Vap. (kJ/kgmole)	1.570e+004	---	---			
30	Kinematic Viscosity (cSt)	---	1.924	1.009			
31	Liq. Mass Density (Std. Cond) (kg/m3)	0.9155	0.9156	1015			
32	Liq. Vol. Flow (Std. Cond) (m3/h)	1.712e+004	1.712e+004	1.167e-003			
33	Liquid Fraction	9.034e-005	0.0000	1.000			
34	Molar Volume (m3/kgmole)	3.755	3.755	1.782e-002			
35	Mass Heat of Vap. (kJ/kg)	728.4	---	---			
36	Phase Fraction [Molar Basis]	0.9999	0.9999	0.0001			
37	Surface Tension (dyne/cm)	73.06	---	73.06			
38	Thermal Conductivity (W/m-K)	---	2.872e-002	0.6022			
39	Viscosity (cP)	---	1.104e-002	1.021			
40	Cv (Semi-Ideal) (kJ/kgmole-C)	33.50	33.50	69.39			
41	Mass Cv (Semi-Ideal) (kJ/kg-C)	1.554	1.554	3.850			
42	Cv (kJ/kgmole-C)	32.62	32.62	67.96			
43	Mass Cv (kJ/kg-C)	1.513	1.513	3.770			
44	Cv (Ent. Method) (kJ/kgmole-C)	---	---	67.70			
45	Mass Cv (Ent. Method) (kJ/kg-C)	---	---	3.756			
46	Cp/Cv (Ent. Method)	---	---	1.148			
47	Reid VP at 37.8 C (bar_g)	---	---	37.07			
48	True VP at 37.8 C (bar_g)	---	---	-0.2787			
49	Liq. Vol. Flow - Sum(Std. Cond) (m3/h)	1.712e+004	1.712e+004	1.167e-003			
50	Viscosity Index	-17.74	---	---			
51	Ideal Gas Cp/Cv	1.256	1.256	1.330			
52	Ideal Gas Cp (kJ/kgmole-C)	40.82	40.82	33.55			
53	Mass Ideal Gas Cp (kJ/kg-C)	1.894	1.894	1.861			
54	Bubble Point Pressure (bar_g)	178.3	---	---			
55	COMPOSITION						
56							
57							
58	Overall Phase			Vapour Fraction 0.9999			
59	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION
60							
61	H2O	2.6637	0.0037	47.9866	0.0031	0.0481	0.0011
62	CO2	18.3270	0.0252	806.5665	0.0514	0.9773	0.0227
63	H2S	34.2185	0.0471	1166.0308	0.0744	1.4790	0.0344
64	Methane	537.9848	0.7398	8630.8371	0.5505	28.8277	0.6705
65	Ethane	83.0816	0.1142	2498.2546	0.1594	7.0238	0.1634
66	Propane	34.4478	0.0474	1519.0460	0.0969	2.9980	0.0697
67	i-Butane	2.8669	0.0039	166.6381	0.0106	0.2965	0.0069
68	n-Butane	5.9118	0.0081	343.6194	0.0219	0.5892	0.0137
69	Aspen Technology Inc.			Aspen HYSYS Version 11		Page 6 of 39	


1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>				Case Name: BINAK WINTER-D03.hsc			
2								
3								Unit Set: Binak3a1314
4								Date/Time: Mon Mar 7 12:14:35 2022
5	<div>Material Stream: 03 (continued)</div>							
6								Fluid Package: Basis-1
7								Property Package: Peng-Robinson
8								
9	COMPOSITION							
10								
11	Overall Phase (continued)						Vapour Fraction	0.9999
12								
13	COMPONENTS	MOLAR FLOW	MOLE FRACTION	MASS FLOW	MASS FRACTION	LIQUID VOLUME	LIQUID VOLUME	
14		(kgmole/h)		(kg/h)		FLOW (m3/h)	FRACTION	
15	i-Pentane	2.2294	0.0031	160.8520	0.0103	0.2580	0.0060	
16	n-Pentane	1.0543	0.0014	76.0681	0.0049	0.1208	0.0028	
17	n-Hexane	1.6173	0.0022	139.3734	0.0089	0.2103	0.0049	
18	n-Heptane	0.3943	0.0005	39.5080	0.0025	0.0575	0.0013	
19	n-Octane	0.1086	0.0001	12.4096	0.0008	0.0176	0.0004	
20	n-Nonane	0.0516	0.0001	6.6213	0.0004	0.0092	0.0002	
21	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
22	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
23	Nitrogen	2.2552	0.0031	63.1752	0.0040	0.0783	0.0018	
24	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
25	Total	727.2129	1.0000	15676.9866	1.0000	42.9914	1.0000	
26								
27	Vapour Phase						Phase Fraction	0.9999
28	COMPONENTS	MOLAR FLOW	MOLE FRACTION	MASS FLOW	MASS FRACTION	LIQUID VOLUME	LIQUID VOLUME	
29		(kgmole/h)		(kg/h)		FLOW (m3/h)	FRACTION	
30	H2O	2.5980	0.0036	46.8038	0.0030	0.0469	0.0011	
31	CO2	18.3270	0.0252	806.5663	0.0515	0.9773	0.0227	
32	H2S	34.2185	0.0471	1166.0297	0.0744	1.4790	0.0344	
33	Methane	537.9848	0.7399	8630.8371	0.5506	28.8277	0.6706	
34	Ethane	83.0816	0.1143	2498.2546	0.1594	7.0238	0.1634	
35	Propane	34.4478	0.0474	1519.0460	0.0969	2.9980	0.0697	
36	i-Butane	2.8669	0.0039	166.6381	0.0106	0.2965	0.0069	
37	n-Butane	5.9118	0.0081	343.6194	0.0219	0.5892	0.0137	
38	i-Pentane	2.2294	0.0031	160.8520	0.0103	0.2580	0.0060	
39	n-Pentane	1.0543	0.0014	76.0681	0.0049	0.1208	0.0028	
40	n-Hexane	1.6173	0.0022	139.3734	0.0089	0.2103	0.0049	
41	n-Heptane	0.3943	0.0005	39.5080	0.0025	0.0575	0.0013	
42	n-Octane	0.1086	0.0001	12.4096	0.0008	0.0176	0.0004	
43	n-Nonane	0.0516	0.0001	6.6213	0.0004	0.0092	0.0002	
44	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
45	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
46	Nitrogen	2.2552	0.0031	63.1752	0.0040	0.0783	0.0018	
47	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
48	Total	727.1473	1.0000	15675.8025	1.0000	42.9902	1.0000	
49								
50	Aqueous Phase						Phase Fraction	9.034e-005
51	COMPONENTS	MOLAR FLOW	MOLE FRACTION	MASS FLOW	MASS FRACTION	LIQUID VOLUME	LIQUID VOLUME	
52		(kgmole/h)		(kg/h)		FLOW (m3/h)	FRACTION	
53	H2O	0.0657	0.9994	1.1828	0.9989	0.0012	0.9986	
54	CO2	0.0000	0.0001	0.0002	0.0002	0.0000	0.0003	
55	H2S	0.0000	0.0005	0.0011	0.0009	0.0000	0.0011	
56	Methane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
57	Ethane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
58	Propane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
59	i-Butane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
60	n-Butane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
61	i-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
62	n-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
63	n-Hexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
64	n-Heptane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
65	n-Octane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
66	n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
67	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
68	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 7 of 39							


1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>				Case Name: BINAK WINTER-D03.hsc		
2					Unit Set: Binak3a1314		
3							
4					Date/Time: Mon Mar 7 12:14:35 2022		
5							
6	Material Stream: 03 (continued)				Fluid Package: Basis-1		
7					Property Package: Peng-Robinson		
8							
9	COMPOSITION						
10							
11	Aqueous Phase (continued)				Phase Fraction 9.034e-005		
12							
13	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION
14							
15	Nitrogen	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
16	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
17	Total	0.0657	1.0000	1.1841	1.0000	0.0012	1.0000
18							
19	Material Stream: 04				Fluid Package: Basis-1		
20					Property Package: Peng-Robinson		
21	CONDITIONS						
22							
23		Overall	Vapour Phase	Aqueous Phase			
24	Vapour / Phase Fraction	1.0000	1.0000	0.0000			
25	Temperature: (C)	19.02	19.02	19.02			
26	Pressure: (bar_g)	5.100	5.100	5.100			
27	Molar Flow (MMSCFD)	14.60	14.60	0.0000			
28	Mass Flow (kg/h)	1.568e+004	1.568e+004	0.0000			
29	Std Ideal Liq Vol Flow (m3/h)	42.99	42.99	0.0000			
30	Molar Enthalpy (kJ/kgmole)	-8.495e+004	-8.495e+004	-2.866e+005			
31	Molar Entropy (kJ/kgmole-C)	174.9	174.9	52.20			
32	Heat Flow (kW)	-1.716e+004	-1.716e+004	0.0000			
33	Liq Vol Flow @Std Cond (m3/h)	1.712e+004 *	1.712e+004	0.0000			
34	PROPERTIES						
35							
36		Overall	Vapour Phase	Aqueous Phase			
37	Molecular Weight	21.56	21.56	18.02			
38	Molar Density (kgmole/m3)	0.2578	0.2578	56.14			
39	Mass Density (kg/m3)	5.559	5.559	1012			
40	Act. Volume Flow (m3/h)	2820	2820	0.0000			
41	Mass Enthalpy (kJ/kg)	-3941	-3941	-1.590e+004			
42	Mass Entropy (kJ/kg-C)	8.115	8.115	2.896			
43	Heat Capacity (kJ/kgmole-C)	41.77	41.77	77.70			
44	Mass Heat Capacity (kJ/kg-C)	1.937	1.937	4.311			
45	LHV Molar Basis (Std) (kJ/kgmole)	9.374e+005	9.374e+005	241.2			
46	HHV Molar Basis (Std) (kJ/kgmole)	1.026e+006	1.026e+006	4.125e+004			
47	HHV Mass Basis (Std) (kJ/kg)	4.762e+004	4.762e+004	2288			
48	CO2 Loading	---	---	---			
49	CO2 Apparent Mole Conc. (kgmole/m3)	---	---	---			
50	CO2 Apparent Wt. Conc. (kgmol/kg)	---	---	---			
51	LHV Mass Basis (Std) (kJ/kg)	4.348e+004	4.348e+004	13.38			
52	Phase Fraction [Vol. Basis]	1.000	1.000	---			
53	Phase Fraction [Mass Basis]	1.000	1.000	0.0000			
54	Phase Fraction [Act. Vol. Basis]	1.000	1.000	0.0000			
55	Mass Exergy (kJ/kg)	204.6	---	---			
56	Partial Pressure of CO2 (bar_g)	-0.8592	---	---			
57	Cost Based on Flow (Cost/s)	0.0000	0.0000	0.0000			
58	Act. Gas Flow (ACT_m3/h)	2820	2820	---			
59	Avg. Liq. Density (kgmole/m3)	16.92	16.92	55.35			
60	Specific Heat (kJ/kgmole-C)	41.77	41.77	77.70			
61	Std. Gas Flow (Nm3/h)	1.630e+004	1.630e+004	0.0000			
62	Std. Ideal Liq. Mass Density (kg/m3)	364.6	364.6	997.7			
63	Act. Liq. Flow (m3/s)	0.0000	---	0.0000			
64	Z Factor	---	0.9760	4.483e-003			
65	Watson K	17.21	17.21	9.080			
66	User Property	---	---	---			
67	Partial Pressure of H2S (bar_g)	-0.7256	---	---			
68	Cp/(Cp - R)	1.249	1.249	1.120			
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 8 of 39						


1	 <div> <div>Company Name Not Available</div> <div>Bedford, MA</div> <div>USA</div> </div>			Case Name: BINAK WINTER-D03.hsc		
2				Unit Set: Binak3a1314		
3				Date/Time: Mon Mar 7 12:14:35 2022		
4						
5	Material Stream: 04 (continued)				Fluid Package: Basis-1	
6					Property Package: Peng-Robinson	
7						
8						
9	PROPERTIES					
10		Overall	Vapour Phase	Aqueous Phase		
11						
12	Cp/Cv	1.281	1.281	1.143		
13	Heat of Vap. (kJ/kgmole)	1.572e+004	---	---		
14	Kinematic Viscosity (cSt)	1.985	1.985	1.014		
15	Liq. Mass Density (Std. Cond) (kg/m3)	0.9155	0.9155	1015		
16	Liq. Vol. Flow (Std. Cond) (m3/h)	1.712e+004	1.712e+004	0.0000		
17	Liquid Fraction	0.0000	0.0000	1.000		
18	Molar Volume (m3/kgmole)	3.878	3.878	1.781e-002		
19	Mass Heat of Vap. (kJ/kg)	729.4	---	---		
20	Phase Fraction [Molar Basis]	1.0000	1.0000	0.0000		
21	Surface Tension (dyne/cm)	---	---	73.10		
22	Thermal Conductivity (W/m-K)	2.867e-002	2.867e-002	0.6018		
23	Viscosity (cP)	1.103e-002	1.103e-002	1.026		
24	Cv (Semi-Ideal) (kJ/kgmole-C)	33.45	33.45	69.39		
25	Mass Cv (Semi-Ideal) (kJ/kg-C)	1.552	1.552	3.850		
26	Cv (kJ/kgmole-C)	32.60	32.60	67.97		
27	Mass Cv (kJ/kg-C)	1.512	1.512	3.771		
28	Cv (Ent. Method) (kJ/kgmole-C)	---	---	67.69		
29	Mass Cv (Ent. Method) (kJ/kg-C)	---	---	3.755		
30	Cp/Cv (Ent. Method)	---	---	1.148		
31	Reid VP at 37.8 C (bar_g)	---	---	37.09		
32	True VP at 37.8 C (bar_g)	---	---	-0.2967		
33	Liq. Vol. Flow - Sum(Std. Cond) (m3/h)	1.712e+004	1.712e+004	0.0000		
34	Viscosity Index	-17.42	---	---		
35	Ideal Gas Cp/Cv	1.256	1.256	1.330		
36	Ideal Gas Cp (kJ/kgmole-C)	40.81	40.81	33.55		
37	Mass Ideal Gas Cp (kJ/kg-C)	1.893	1.893	1.861		
38	Bubble Point Pressure (bar_g)	178.0	---	---		
39						
40	COMPOSITION					
41						
42	Overall Phase			Vapour Fraction	1.0000	
43	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)
44						LIQUID VOLUME FRACTION
45	H2O	2.6453	0.0036	47.6562	0.0030	0.0478
46	CO2	18.3270	0.0252	806.5665	0.0515	0.9773
47	H2S	34.2185	0.0471	1166.0305	0.0744	1.4790
48	Methane	537.9848	0.7398	8630.8371	0.5506	28.8277
49	Ethane	83.0816	0.1142	2498.2546	0.1594	7.0238
50	Propane	34.4478	0.0474	1519.0460	0.0969	2.9980
51	i-Butane	2.8669	0.0039	166.6381	0.0106	0.2965
52	n-Butane	5.9118	0.0081	343.6194	0.0219	0.5892
53	i-Pentane	2.2294	0.0031	160.8520	0.0103	0.2580
54	n-Pentane	1.0543	0.0014	76.0681	0.0049	0.1208
55	n-Hexane	1.6173	0.0022	139.3734	0.0089	0.2103
56	n-Heptane	0.3943	0.0005	39.5080	0.0025	0.0575
57	n-Octane	0.1086	0.0001	12.4096	0.0008	0.0176
58	n-Nonane	0.0516	0.0001	6.6213	0.0004	0.0092
59	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000
60	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000
61	Nitrogen	2.2552	0.0031	63.1752	0.0040	0.0783
62	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000
63	Total	727.1946	1.0000	15676.6559	1.0000	42.9910
64						
65	Vapour Phase			Phase Fraction	1.000	
66	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)
67						LIQUID VOLUME FRACTION
68	H2O	2.6453	0.0036	47.6562	0.0030	0.0478
69						


1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>				Case Name: BINAK WINTER-D03.hsc		
2					Unit Set: Binak3a1314		
3							
4							
5					Date/Time: Mon Mar 7 12:14:35 2022		
6	<div>Material Stream: 04 (continued)</div>					Fluid Package:	Basis-1
7						Property Package:	Peng-Robinson
8							
9							
10	COMPOSITION						
11	Vapour Phase (continued)						
12						Phase Fraction	1.000
13	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION
14							
15	CO2	18.3270	0.0252	806.5665	0.0515	0.9773	0.0227
16	H2S	34.2185	0.0471	1166.0305	0.0744	1.4790	0.0344
17	Methane	537.9848	0.7398	8630.8371	0.5506	28.8277	0.6706
18	Ethane	83.0816	0.1142	2498.2546	0.1594	7.0238	0.1634
19	Propane	34.4478	0.0474	1519.0460	0.0969	2.9980	0.0697
20	i-Butane	2.8669	0.0039	166.6381	0.0106	0.2965	0.0069
21	n-Butane	5.9118	0.0081	343.6194	0.0219	0.5892	0.0137
22	i-Pentane	2.2294	0.0031	160.8520	0.0103	0.2580	0.0060
23	n-Pentane	1.0543	0.0014	76.0681	0.0049	0.1208	0.0028
24	n-Hexane	1.6173	0.0022	139.3734	0.0089	0.2103	0.0049
25	n-Heptane	0.3943	0.0005	39.5080	0.0025	0.0575	0.0013
26	n-Octane	0.1086	0.0001	12.4096	0.0008	0.0176	0.0004
27	n-Nonane	0.0516	0.0001	6.6213	0.0004	0.0092	0.0002
28	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
29	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	Nitrogen	2.2552	0.0031	63.1752	0.0040	0.0783	0.0018
31	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
32	Total	727.1946	1.0000	15676.6559	1.0000	42.9910	1.0000
33	Aqueous Phase						
34						Phase Fraction	0.0000
35	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION
36							
37	H2O	0.0000	0.9995	0.0000	0.9989	0.0000	0.9986
38	CO2	0.0000	0.0001	0.0000	0.0002	0.0000	0.0002
39	H2S	0.0000	0.0005	0.0000	0.0009	0.0000	0.0011
40	Methane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
41	Ethane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
42	Propane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
43	i-Butane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
44	n-Butane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
45	i-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
46	n-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
47	n-Hexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
48	n-Heptane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
49	n-Octane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
50	n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
51	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
52	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
53	Nitrogen	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
54	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
55	Total	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000
56	<div>Material Stream: 05</div>					Fluid Package:	Basis-1
57						Property Package:	Peng-Robinson
58							
59							
60	CONDITIONS						
61		Overall	Vapour Phase	Aqueous Phase			
62	Vapour / Phase Fraction	1.0000	1.0000	0.0000			
63	Temperature: (C)	19.02	19.02	19.02			
64	Pressure: (bar_g)	5.100	5.100	5.100			
65	Molar Flow (MMSCFD)	7.065	7.065	0.0000			
66	Mass Flow (kg/h)	7585	7585	0.0000			
67	Std Ideal Liq Vol Flow (m3/h)	20.80	20.80	0.0000			
68	Molar Enthalpy (kJ/kgmole)	-8.495e+004	-8.495e+004	-2.866e+005			
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 10 of 39						


1	 Company Name Not Available Bedford, MA USA		Case Name: BINAK WINTER-D03.hsc		
2			Unit Set: Binak3a1314		
3			Date/Time: Mon Mar 7 12:14:35 2022		
4					
5	Material Stream: 05 (continued)			Fluid Package: Basis-1	
6				Property Package: Peng-Robinson	
7					
8					
9	CONDITIONS				
10					
11		Overall	Vapour Phase	Aqueous Phase	
12	Molar Entropy (kJ/kgmole-C)	174.9	174.9	52.20	
13	Heat Flow (kW)	-8304	-8304	0.0000	
14	Liq Vol Flow @Std Cond (m3/h)	8285 *	8285	0.0000	
15	PROPERTIES				
16					
17		Overall	Vapour Phase	Aqueous Phase	
18	Molecular Weight	21.56	21.56	18.02	
19	Molar Density (kgmole/m3)	0.2578	0.2578	56.14	
20	Mass Density (kg/m3)	5.559	5.559	1012	
21	Act. Volume Flow (m3/h)	1365	1365	0.0000	
22	Mass Enthalpy (kJ/kg)	-3941	-3941	-1.590e+004	
23	Mass Entropy (kJ/kg-C)	8.115	8.115	2.896	
24	Heat Capacity (kJ/kgmole-C)	41.77	41.77	77.70	
25	Mass Heat Capacity (kJ/kg-C)	1.937	1.937	4.311	
26	LHV Molar Basis (Std) (kJ/kgmole)	9.374e+005	9.374e+005	241.2	
27	HHV Molar Basis (Std) (kJ/kgmole)	1.026e+006	1.026e+006	4.125e+004	
28	HHV Mass Basis (Std) (kJ/kg)	4.762e+004	4.762e+004	2288	
29	CO2 Loading	---	---	---	
30	CO2 Apparent Mole Conc. (kgmole/m3)	---	---	---	
31	CO2 Apparent Wt. Conc. (kgmol/kg)	---	---	---	
32	LHV Mass Basis (Std) (kJ/kg)	4.348e+004	4.348e+004	13.38	
33	Phase Fraction [Vol. Basis]	1.000	1.000	---	
34	Phase Fraction [Mass Basis]	1.000	1.000	0.0000	
35	Phase Fraction [Act. Vol. Basis]	1.000	1.000	0.0000	
36	Mass Exergy (kJ/kg)	204.6	---	---	
37	Partial Pressure of CO2 (bar_g)	-0.8592	---	---	
38	Cost Based on Flow (Cost/s)	0.0000	0.0000	0.0000	
39	Act. Gas Flow (ACT_m3/h)	1365	1365	---	
40	Avg. Liq. Density (kgmole/m3)	16.92	16.92	55.35	
41	Specific Heat (kJ/kgmole-C)	41.77	41.77	77.70	
42	Std. Gas Flow (Nm3/h)	7887	7887	0.0000	
43	Std. Ideal Liq. Mass Density (kg/m3)	364.6	364.6	997.7	
44	Act. Liq. Flow (m3/s)	0.0000	---	0.0000	
45	Z Factor	---	0.9760	4.483e-003	
46	Watson K	17.21	17.21	9.080	
47	User Property	---	---	---	
48	Partial Pressure of H2S (bar_g)	-0.7256	---	---	
49	Cp/(Cp - R)	1.249	1.249	1.120	
50	Cp/Cv	1.281	1.281	1.143	
51	Heat of Vap. (kJ/kgmole)	1.572e+004	---	---	
52	Kinematic Viscosity (cSt)	1.985	1.985	1.014	
53	Liq. Mass Density (Std. Cond) (kg/m3)	0.9155	0.9155	1015	
54	Liq. Vol. Flow (Std. Cond) (m3/h)	8285	8285	0.0000	
55	Liquid Fraction	0.0000	0.0000	1.000	
56	Molar Volume (m3/kgmole)	3.878	3.878	1.781e-002	
57	Mass Heat of Vap. (kJ/kg)	729.4	---	---	
58	Phase Fraction [Molar Basis]	1.0000	1.0000	0.0000	
59	Surface Tension (dyne/cm)	---	---	73.10	
60	Thermal Conductivity (W/m-K)	2.867e-002	2.867e-002	0.6018	
61	Viscosity (cP)	1.103e-002	1.103e-002	1.026	
62	Cv (Semi-Ideal) (kJ/kgmole-C)	33.45	33.45	69.39	
63	Mass Cv (Semi-Ideal) (kJ/kg-C)	1.552	1.552	3.850	
64	Cv (kJ/kgmole-C)	32.60	32.60	67.97	
65	Mass Cv (kJ/kg-C)	1.512	1.512	3.771	
66	Cv (Ent. Method) (kJ/kgmole-C)	---	---	67.69	
67	Mass Cv (Ent. Method) (kJ/kg-C)	---	---	3.755	
68	Cp/Cv (Ent. Method)	---	---	1.148	
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 11 of 39				
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1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>			Case Name: BINAK WINTER-D03.hsc					
2				Unit Set: Binak3a1314					
3									
4				Date/Time: Mon Mar 7 12:14:35 2022					
5	<div>Material Stream: 05 (continued)</div>								
6								Fluid Package: Basis-1	
7								Property Package: Peng-Robinson	
8									
9	PROPERTIES								
10									
11		Overall	Vapour Phase	Aqueous Phase					
12	Reid VP at 37.8 C (bar_g)	---	---	37.07					
13	True VP at 37.8 C (bar_g)	---	---	-0.2967					
14	Liq. Vol. Flow - Sum(Std. Cond) (m3/h)	8285	8285	0.0000					
15	Viscosity Index	-17.42	---	---					
16	Ideal Gas Cp/Cv	1.256	1.256	1.330					
17	Ideal Gas Cp (kJ/kgmole-C)	40.81	40.81	33.55					
18	Mass Ideal Gas Cp (kJ/kg-C)	1.893	1.893	1.861					
19	Bubble Point Pressure (bar_g)	178.0	---	---					
20	COMPOSITION								
21									
22									
23	Overall Phase				Vapour Fraction 1.0000				
24	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION		
25									
26	H2O	1.2800	0.0036	23.0594	0.0030	0.0231	0.0011		
27	CO2	8.8679	0.0252	390.2723	0.0515	0.4729	0.0227		
28	H2S	16.5573	0.0471	564.2056	0.0744	0.7156	0.0344		
29	Methane	260.3140	0.7398	4176.1918	0.5506	13.9488	0.6706		
30	Ethane	40.2006	0.1142	1208.8272	0.1594	3.3986	0.1634		
31	Propane	16.6682	0.0474	735.0188	0.0969	1.4507	0.0697		
32	i-Butane	1.3872	0.0039	80.6310	0.0106	0.1435	0.0069		
33	n-Butane	2.8606	0.0081	166.2667	0.0219	0.2851	0.0137		
34	i-Pentane	1.0787	0.0031	77.8312	0.0103	0.1248	0.0060		
35	n-Pentane	0.5101	0.0014	36.8070	0.0049	0.0584	0.0028		
36	n-Hexane	0.7825	0.0022	67.4384	0.0089	0.1018	0.0049		
37	n-Heptane	0.1908	0.0005	19.1167	0.0025	0.0278	0.0013		
38	n-Octane	0.0526	0.0001	6.0046	0.0008	0.0085	0.0004		
39	n-Nonane	0.0250	0.0001	3.2039	0.0004	0.0044	0.0002		
40	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
41	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
42	Nitrogen	1.0912	0.0031	30.5685	0.0040	0.0379	0.0018		
43	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
44	Total	351.8667	1.0000	7585.4428	1.0000	20.8020	1.0000		
45	Vapour Phase								
46					Phase Fraction 1.000				
47	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION		
48									
49	H2O	1.2800	0.0036	23.0594	0.0030	0.0231	0.0011		
50	CO2	8.8679	0.0252	390.2723	0.0515	0.4729	0.0227		
51	H2S	16.5573	0.0471	564.2056	0.0744	0.7156	0.0344		
52	Methane	260.3140	0.7398	4176.1918	0.5506	13.9488	0.6706		
53	Ethane	40.2006	0.1142	1208.8272	0.1594	3.3986	0.1634		
54	Propane	16.6682	0.0474	735.0188	0.0969	1.4507	0.0697		
55	i-Butane	1.3872	0.0039	80.6310	0.0106	0.1435	0.0069		
56	n-Butane	2.8606	0.0081	166.2667	0.0219	0.2851	0.0137		
57	i-Pentane	1.0787	0.0031	77.8312	0.0103	0.1248	0.0060		
58	n-Pentane	0.5101	0.0014	36.8070	0.0049	0.0584	0.0028		
59	n-Hexane	0.7825	0.0022	67.4384	0.0089	0.1018	0.0049		
60	n-Heptane	0.1908	0.0005	19.1167	0.0025	0.0278	0.0013		
61	n-Octane	0.0526	0.0001	6.0046	0.0008	0.0085	0.0004		
62	n-Nonane	0.0250	0.0001	3.2039	0.0004	0.0044	0.0002		
63	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
64	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
65	Nitrogen	1.0912	0.0031	30.5685	0.0040	0.0379	0.0018		
66	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
67	Total	351.8667	1.0000	7585.4428	1.0000	20.8020	1.0000		
68									
69	Aspen Technology Inc.		Aspen HYSYS Version 11			Page 12 of 39			


1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>			Case Name: BINAK WINTER-D03.hsc		
2				Unit Set: Binak3a1314		
3				Date/Time: Mon Mar 7 12:14:35 2022		
4						
5						
6	Material Stream: 05 (continued)				Fluid Package:	Basis-1
7					Property Package:	Peng-Robinson
8						
9	COMPOSITION					
10						
11	Aqueous Phase					
12	Phase Fraction 0.0000					
13	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)
14						LIQUID VOLUME FRACTION
15	H2O	0.0000	0.9995	0.0000	0.9989	0.0000
16	CO2	0.0000	0.0001	0.0000	0.0002	0.0000
17	H2S	0.0000	0.0005	0.0000	0.0009	0.0000
18	Methane	0.0000	0.0000	0.0000	0.0000	0.0000
19	Ethane	0.0000	0.0000	0.0000	0.0000	0.0000
20	Propane	0.0000	0.0000	0.0000	0.0000	0.0000
21	i-Butane	0.0000	0.0000	0.0000	0.0000	0.0000
22	n-Butane	0.0000	0.0000	0.0000	0.0000	0.0000
23	i-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000
24	n-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000
25	n-Hexane	0.0000	0.0000	0.0000	0.0000	0.0000
26	n-Heptane	0.0000	0.0000	0.0000	0.0000	0.0000
27	n-Octane	0.0000	0.0000	0.0000	0.0000	0.0000
28	n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000
29	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000
30	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000
31	Nitrogen	0.0000	0.0000	0.0000	0.0000	0.0000
32	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000
33	Total	0.0000	1.0000	0.0000	1.0000	0.0000
34						
35	Material Stream: 06				Fluid Package:	Basis-1
36					Property Package:	Peng-Robinson
37						
38	CONDITIONS					
39		Overall	Vapour Phase	Aqueous Phase		
40	Vapour / Phase Fraction	1.0000	1.0000	0.0000		
41	Temperature: (C)	18.88	18.88	18.88		
42	Pressure: (bar_g)	4.900	4.900	4.900		
43	Molar Flow (MMSCFD)	7.065	7.065	0.0000		
44	Mass Flow (kg/h)	7585	7585	0.0000		
45	Std Ideal Liq Vol Flow (m3/h)	20.80	20.80	0.0000		
46	Molar Enthalpy (kJ/kgmole)	-8.495e+004	-8.495e+004	-2.866e+005		
47	Molar Entropy (kJ/kgmole-C)	175.2	175.2	52.16		
48	Heat Flow (kW)	-8304	-8304	0.0000		
49	Liq Vol Flow @Std Cond (m3/h)	8285 *	8285	0.0000		
50						
51	PROPERTIES					
52		Overall	Vapour Phase	Aqueous Phase		
53	Molecular Weight	21.56	21.56	18.02		
54	Molar Density (kgmole/m3)	0.2493	0.2493	47.31		
55	Mass Density (kg/m3)	5.375	5.375	852.7		
56	Act. Volume Flow (m3/h)	1411	1411	0.0000		
57	Mass Enthalpy (kJ/kg)	-3941	-3941	-1.590e+004		
58	Mass Entropy (kJ/kg-C)	8.128	8.128	2.894		
59	Heat Capacity (kJ/kgmole-C)	41.73	41.73	77.71		
60	Mass Heat Capacity (kJ/kg-C)	1.936	1.936	4.311		
61	LHV Molar Basis (Std) (kJ/kgmole)	9.374e+005	9.374e+005	239.9		
62	HHV Molar Basis (Std) (kJ/kgmole)	1.026e+006	1.026e+006	4.125e+004		
63	HHV Mass Basis (Std) (kJ/kg)	4.762e+004	4.762e+004	2288		
64	CO2 Loading	---	---	---		
65	CO2 Apparent Mole Conc. (kgmole/m3)	---	---	---		
66	CO2 Apparent Wt. Conc. (kgmol/kg)	---	---	---		
67	LHV Mass Basis (Std) (kJ/kg)	4.348e+004	4.348e+004	13.31		
68	Phase Fraction [Vol. Basis]	1.000	1.000	---		
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 13 of 39					


1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>			Case Name: BINAK WINTER-D03.hsc		
2				Unit Set: Binak3a1314		
3				Date/Time: Mon Mar 7 12:14:35 2022		
4						
5	<div>Material Stream: 06 (continued)</div>			Fluid Package: Basis-1		
6				Property Package: Peng-Robinson		
7						
8						
9	PROPERTIES					
10						
11		Overall	Vapour Phase	Aqueous Phase		
12	Phase Fraction [Mass Basis]	1.000	1.000	0.0000		
13	Phase Fraction [Act. Vol. Basis]	1.000	1.000	0.0000		
14	Mass Exergy (kJ/kg)	200.9	---	---		
15	Partial Pressure of CO2 (bar_g)	-0.8642	---	---		
16	Cost Based on Flow (Cost/s)	0.0000	0.0000	0.0000		
17	Act. Gas Flow (ACT_m3/h)	1411	1411	---		
18	Avg. Liq. Density (kgmole/m3)	16.92	16.92	55.35		
19	Specific Heat (kJ/kgmole-C)	41.73	41.73	77.71		
20	Std. Gas Flow (Nm3/h)	7887	7887	0.0000		
21	Std. Ideal Liq. Mass Density (kg/m3)	364.6	364.6	997.7		
22	Act. Liq. Flow (m3/s)	0.0000	---	0.0000		
23	Z Factor	---	0.9767	5.148e-003		
24	Watson K	17.21	17.21	9.080		
25	User Property	---	---	---		
26	Partial Pressure of H2S (bar_g)	-0.7350	---	---		
27	Cp/(Cp - R)	1.249	1.249	1.120		
28	Cp/Cv	1.280	1.280	1.143		
29	Heat of Vap. (kJ/kgmole)	1.575e+004	---	---		
30	Kinematic Viscosity (cSt)	2.051	2.051	1.207		
31	Liq. Mass Density (Std. Cond) (kg/m3)	0.9155	0.9155	1015		
32	Liq. Vol. Flow (Std. Cond) (m3/h)	8285	8285	0.0000		
33	Liquid Fraction	0.0000	0.0000	1.000		
34	Molar Volume (m3/kgmole)	4.011	4.011	2.114e-002		
35	Mass Heat of Vap. (kJ/kg)	730.7	---	---		
36	Phase Fraction [Molar Basis]	1.0000	1.0000	0.0000		
37	Surface Tension (dyne/cm)	---	---	73.12		
38	Thermal Conductivity (W/m-K)	2.863e-002	2.863e-002	0.6016		
39	Viscosity (cP)	1.102e-002	1.102e-002	1.030		
40	Cv (Semi-Ideal) (kJ/kgmole-C)	33.41	33.41	69.39		
41	Mass Cv (Semi-Ideal) (kJ/kg-C)	1.550	1.550	3.850		
42	Cv (kJ/kgmole-C)	32.59	32.59	67.98		
43	Mass Cv (kJ/kg-C)	1.512	1.512	3.771		
44	Cv (Ent. Method) (kJ/kgmole-C)	---	---	---		
45	Mass Cv (Ent. Method) (kJ/kg-C)	---	---	---		
46	Cp/Cv (Ent. Method)	---	---	---		
47	Reid VP at 37.8 C (bar_g)	---	---	37.08		
48	True VP at 37.8 C (bar_g)	---	---	-0.3005		
49	Liq. Vol. Flow - Sum(Std. Cond) (m3/h)	8285	8285	0.0000		
50	Viscosity Index	-17.08	---	---		
51	Ideal Gas Cp/Cv	1.256	1.256	1.330		
52	Ideal Gas Cp (kJ/kgmole-C)	40.80	40.80	33.54		
53	Mass Ideal Gas Cp (kJ/kg-C)	1.893	1.893	1.861		
54	Bubble Point Pressure (bar_g)	177.8	---	---		
55	COMPOSITION					
56						
57	Overall Phase					
58					Vapour Fraction	1.0000
59	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)
60						LIQUID VOLUME FRACTION
61	H2O	1.2800	0.0036	23.0594	0.0030	0.0231
62	CO2	8.8679	0.0252	390.2723	0.0515	0.4729
63	H2S	16.5573	0.0471	564.2056	0.0744	0.7156
64	Methane	260.3140	0.7398	4176.1918	0.5506	13.9488
65	Ethane	40.2006	0.1142	1208.8272	0.1594	3.3986
66	Propane	16.6682	0.0474	735.0188	0.0969	1.4507
67	i-Butane	1.3872	0.0039	80.6310	0.0106	0.1435
68	n-Butane	2.8606	0.0081	166.2667	0.0219	0.2851
69	Aspen Technology Inc.		Aspen HYSYS Version 11		Page 14 of 39	


1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>			Case Name: BINAK WINTER-D03.hsc							
2											
3								Unit Set: Binak3a1314			
4								Date/Time: Mon Mar 7 12:14:35 2022			
5											
6	Material Stream: 06 (continued)				Fluid Package: Basis-1						
7					Property Package: Peng-Robinson						
8											
9	COMPOSITION										
10											
11	Overall Phase (continued)										
12						Vapour Fraction	1.0000				
13	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION				
14											
15	i-Pentane	1.0787	0.0031	77.8312	0.0103	0.1248	0.0060				
16	n-Pentane	0.5101	0.0014	36.8070	0.0049	0.0584	0.0028				
17	n-Hexane	0.7825	0.0022	67.4384	0.0089	0.1018	0.0049				
18	n-Heptane	0.1908	0.0005	19.1167	0.0025	0.0278	0.0013				
19	n-Octane	0.0526	0.0001	6.0046	0.0008	0.0085	0.0004				
20	n-Nonane	0.0250	0.0001	3.2039	0.0004	0.0044	0.0002				
21	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
22	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
23	Nitrogen	1.0912	0.0031	30.5685	0.0040	0.0379	0.0018				
24	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
25	Total	351.8667	1.0000	7585.4428	1.0000	20.8020	1.0000				
26											
27	Vapour Phase										
28						Phase Fraction	1.000				
29	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION				
30	H2O	1.2800	0.0036	23.0594	0.0030	0.0231	0.0011				
31	CO2	8.8679	0.0252	390.2723	0.0515	0.4729	0.0227				
32	H2S	16.5573	0.0471	564.2056	0.0744	0.7156	0.0344				
33	Methane	260.3140	0.7398	4176.1918	0.5506	13.9488	0.6706				
34	Ethane	40.2006	0.1142	1208.8272	0.1594	3.3986	0.1634				
35	Propane	16.6682	0.0474	735.0188	0.0969	1.4507	0.0697				
36	i-Butane	1.3872	0.0039	80.6310	0.0106	0.1435	0.0069				
37	n-Butane	2.8606	0.0081	166.2667	0.0219	0.2851	0.0137				
38	i-Pentane	1.0787	0.0031	77.8312	0.0103	0.1248	0.0060				
39	n-Pentane	0.5101	0.0014	36.8070	0.0049	0.0584	0.0028				
40	n-Hexane	0.7825	0.0022	67.4384	0.0089	0.1018	0.0049				
41	n-Heptane	0.1908	0.0005	19.1167	0.0025	0.0278	0.0013				
42	n-Octane	0.0526	0.0001	6.0046	0.0008	0.0085	0.0004				
43	n-Nonane	0.0250	0.0001	3.2039	0.0004	0.0044	0.0002				
44	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
45	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
46	Nitrogen	1.0912	0.0031	30.5685	0.0040	0.0379	0.0018				
47	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
48	Total	351.8667	1.0000	7585.4428	1.0000	20.8020	1.0000				
49											
50	Aqueous Phase										
51						Phase Fraction	0.0000				
52	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION				
53	H2O	0.0000	0.9995	0.0000	0.9989	0.0000	0.9986				
54	CO2	0.0000	0.0001	0.0000	0.0002	0.0000	0.0002				
55	H2S	0.0000	0.0005	0.0000	0.0009	0.0000	0.0011				
56	Methane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
57	Ethane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
58	Propane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
59	i-Butane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
60	n-Butane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
61	i-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
62	n-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
63	n-Hexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
64	n-Heptane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
65	n-Octane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
66	n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
67	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
68	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 15 of 39										

1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>				Case Name: BINAK WINTER-D03.hsc				
2									
3								Unit Set: Binak3a1314	
4								Date/Time: Mon Mar 7 12:14:35 2022	
5									
6	Material Stream: 06 (continued)				Fluid Package: Basis-1				
7					Property Package: Peng-Robinson				
8									
9	COMPOSITION								
10									
11	Aqueous Phase (continued)				Phase Fraction 0.0000				
12									
13	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION		
14									
15	Nitrogen	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
16	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
17	Total	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000		
18	Material Stream: 07				Fluid Package: Basis-1				
19					Property Package: Peng-Robinson				
20									
21	CONDITIONS								
22									
23		Overall	Vapour Phase						
24	Vapour / Phase Fraction	1.0000	1.0000						
25	Temperature: (C)	113.1	113.1						
26	Pressure: (bar_g)	19.00 *	19.00						
27	Molar Flow (MMSCFD)	7.065	7.065						
28	Mass Flow (kg/h)	7585	7585						
29	Std Ideal Liq Vol Flow (m3/h)	20.80	20.80						
30	Molar Enthalpy (kJ/kgmole)	-8.104e+004	-8.104e+004						
31	Molar Entropy (kJ/kgmole-C)	176.9	176.9						
32	Heat Flow (kW)	-7921	-7921						
33	Liq Vol Flow @Std Cond (m3/h)	8285 *	8285						
34									
35	PROPERTIES								
36		Overall	Vapour Phase						
37	Molecular Weight	21.56	21.56						
38	Molar Density (kgmole/m3)	0.6425	0.6425						
39	Mass Density (kg/m3)	13.85	13.85						
40	Act. Volume Flow (m3/h)	547.7	547.7						
41	Mass Enthalpy (kJ/kg)	-3759	-3759						
42	Mass Entropy (kJ/kg-C)	8.208	8.208						
43	Heat Capacity (kJ/kgmole-C)	48.40	48.40						
44	Mass Heat Capacity (kJ/kg-C)	2.245	2.245						
45	LHV Molar Basis (Std) (kJ/kgmole)	9.374e+005	9.374e+005						
46	HHV Molar Basis (Std) (kJ/kgmole)	1.026e+006	1.026e+006						
47	HHV Mass Basis (Std) (kJ/kg)	4.762e+004	4.762e+004						
48	CO2 Loading	---	---						
49	CO2 Apparent Mole Conc. (kgmole/m3)	---	---						
50	CO2 Apparent Wt. Conc. (kgmol/kg)	---	---						
51	LHV Mass Basis (Std) (kJ/kg)	4.348e+004	4.348e+004						
52	Phase Fraction [Vol. Basis]	1.000	1.000						
53	Phase Fraction [Mass Basis]	1.000	1.000						
54	Phase Fraction [Act. Vol. Basis]	1.000	1.000						
55	Mass Exergy (kJ/kg)	358.7	---						
56	Partial Pressure of CO2 (bar_g)	-0.5089	---						
57	Cost Based on Flow (Cost/s)	0.0000	0.0000						
58	Act. Gas Flow (ACT_m3/h)	547.7	547.7						
59	Avg. Liq. Density (kgmole/m3)	16.92	16.92						
60	Specific Heat (kJ/kgmole-C)	48.40	48.40						
61	Std. Gas Flow (Nm3/h)	7887	7887						
62	Std. Ideal Liq. Mass Density (kg/m3)	364.6	364.6						
63	Act. Liq. Flow (m3/s)	---	---						
64	Z Factor	0.9700	0.9700						
65	Watson K	17.21	17.21						
66	User Property	---	---						
67	Partial Pressure of H2S (bar_g)	-7.152e-002	---						
68	Cp/(Cp - R)	1.207	1.207						
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 16 of 39								


1	 <div> <div>Company Name Not Available</div> <div>Bedford, MA</div> <div>USA</div> </div>			Case Name: BINAK WINTER-D03.hsc		
2				Unit Set: Binak3a1314		
3				Date/Time: Mon Mar 7 12:14:35 2022		
4						
5	Material Stream: 07 (continued)				Fluid Package: Basis-1	
6					Property Package: Peng-Robinson	
7						
8						
9	PROPERTIES					
10						
11		Overall	Vapour Phase			
12	Cp/Cv	1.253	1.253			
13	Heat of Vap. (kJ/kgmole)	1.419e+004	---			
14	Kinematic Viscosity (cSt)	1.043	1.043			
15	Liq. Mass Density (Std. Cond) (kg/m3)	0.9155	0.9155			
16	Liq. Vol. Flow (Std. Cond) (m3/h)	8285	8285			
17	Liquid Fraction	0.0000	0.0000			
18	Molar Volume (m3/kgmole)	1.556	1.556			
19	Mass Heat of Vap. (kJ/kg)	658.3	---			
20	Phase Fraction [Molar Basis]	1.0000	1.0000			
21	Surface Tension (dyne/cm)	---	---			
22	Thermal Conductivity (W/m-K)	4.242e-002	4.242e-002			
23	Viscosity (cP)	1.445e-002	1.445e-002			
24	Cv (Semi-Ideal) (kJ/kgmole-C)	40.09	40.09			
25	Mass Cv (Semi-Ideal) (kJ/kg-C)	1.860	1.860			
26	Cv (kJ/kgmole-C)	38.62	38.62			
27	Mass Cv (kJ/kg-C)	1.792	1.792			
28	Cv (Ent. Method) (kJ/kgmole-C)	---	---			
29	Mass Cv (Ent. Method) (kJ/kg-C)	---	---			
30	Cp/Cv (Ent. Method)	---	---			
31	Reid VP at 37.8 C (bar_g)	---	---			
32	True VP at 37.8 C (bar_g)	---	---			
33	Liq. Vol. Flow - Sum(Std. Cond) (m3/h)	8285	8285			
34	Viscosity Index	-22.02	---			
35	Ideal Gas Cp/Cv	1.217	1.217			
36	Ideal Gas Cp (kJ/kgmole-C)	46.71	46.71			
37	Mass Ideal Gas Cp (kJ/kg-C)	2.167	2.167			
38	Bubble Point Pressure (bar_g)	---	---			
39	COMPOSITION					
40						
41						
42	Overall Phase			Vapour Fraction	1.0000	
43	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)
44						LIQUID VOLUME FRACTION
45	H2O	1.2800	0.0036	23.0594	0.0030	0.0231
46	CO2	8.8679	0.0252	390.2723	0.0515	0.4729
47	H2S	16.5573	0.0471	564.2056	0.0744	0.7156
48	Methane	260.3140	0.7398	4176.1918	0.5506	13.9488
49	Ethane	40.2006	0.1142	1208.8272	0.1594	3.3986
50	Propane	16.6682	0.0474	735.0188	0.0969	1.4507
51	i-Butane	1.3872	0.0039	80.6310	0.0106	0.1435
52	n-Butane	2.8606	0.0081	166.2667	0.0219	0.2851
53	i-Pentane	1.0787	0.0031	77.8312	0.0103	0.1248
54	n-Pentane	0.5101	0.0014	36.8070	0.0049	0.0584
55	n-Hexane	0.7825	0.0022	67.4384	0.0089	0.1018
56	n-Heptane	0.1908	0.0005	19.1167	0.0025	0.0278
57	n-Octane	0.0526	0.0001	6.0046	0.0008	0.0085
58	n-Nonane	0.0250	0.0001	3.2039	0.0004	0.0044
59	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000
60	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000
61	Nitrogen	1.0912	0.0031	30.5685	0.0040	0.0379
62	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000
63	Total	351.8667	1.0000	7585.4428	1.0000	20.8020
64	Vapour Phase					
65				Phase Fraction	1.000	
66	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)
67						LIQUID VOLUME FRACTION
68	H2O	1.2800	0.0036	23.0594	0.0030	0.0231
69	<div> <div>Aspen Technology Inc.</div> <div>Aspen HYSYS Version 11</div> <div>Page 17 of 39</div> </div>					


1	 <div> <div>Company Name Not Available</div> <div>Bedford, MA</div> <div>USA</div> </div>			Case Name: BINAK WINTER-D03.hsc		
2				Unit Set: Binak3a1314		
3				Date/Time: Mon Mar 7 12:14:35 2022		
4						
5	Material Stream: 07 (continued)				Fluid Package: Basis-1	
6					Property Package: Peng-Robinson	
7						
8	COMPOSITION					
9						
10	Vapour Phase (continued)					
11						Phase Fraction 1.000
12						
13	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)
14						LIQUID VOLUME FRACTION
15	CO2	8.8679	0.0252	390.2723	0.0515	0.4729
16	H2S	16.5573	0.0471	564.2056	0.0744	0.7156
17	Methane	260.3140	0.7398	4176.1918	0.5506	13.9488
18	Ethane	40.2006	0.1142	1208.8272	0.1594	3.3986
19	Propane	16.6682	0.0474	735.0188	0.0969	1.4507
20	i-Butane	1.3872	0.0039	80.6310	0.0106	0.1435
21	n-Butane	2.8606	0.0081	166.2667	0.0219	0.2851
22	i-Pentane	1.0787	0.0031	77.8312	0.0103	0.1248
23	n-Pentane	0.5101	0.0014	36.8070	0.0049	0.0584
24	n-Hexane	0.7825	0.0022	67.4384	0.0089	0.1018
25	n-Heptane	0.1908	0.0005	19.1167	0.0025	0.0278
26	n-Octane	0.0526	0.0001	6.0046	0.0008	0.0085
27	n-Nonane	0.0250	0.0001	3.2039	0.0004	0.0044
28	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000
29	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000
30	Nitrogen	1.0912	0.0031	30.5685	0.0040	0.0379
31	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000
32	Total	351.8667	1.0000	7585.4428	1.0000	20.8020
33	Material Stream: 08				Fluid Package: Basis-1	
34					Property Package: Peng-Robinson	
35						
36	CONDITIONS					
37						
38		Overall	Vapour Phase			
39	Vapour / Phase Fraction	1.0000	1.0000			
40	Temperature: (C)	60.00 *	60.00			
41	Pressure: (bar_g)	18.30	18.30			
42	Molar Flow (MMSCFD)	7.065	7.065			
43	Mass Flow (kg/h)	7585	7585			
44	Std Ideal Liq Vol Flow (m3/h)	20.80	20.80			
45	Molar Enthalpy (kJ/kgmole)	-8.351e+004	-8.351e+004			
46	Molar Entropy (kJ/kgmole-C)	170.3	170.3			
47	Heat Flow (kW)	-8163	-8163			
48	Liq Vol Flow @Std Cond (m3/h)	8285 *	8285			
49	PROPERTIES					
50						
51		Overall	Vapour Phase			
52	Molecular Weight	21.56	21.56			
53	Molar Density (kgmole/m3)	0.7333	0.7333			
54	Mass Density (kg/m3)	15.81	15.81			
55	Act. Volume Flow (m3/h)	479.8	479.8			
56	Mass Enthalpy (kJ/kg)	-3874	-3874			
57	Mass Entropy (kJ/kg-C)	7.901	7.901			
58	Heat Capacity (kJ/kgmole-C)	45.63	45.63			
59	Mass Heat Capacity (kJ/kg-C)	2.117	2.117			
60	LHV Molar Basis (Std) (kJ/kgmole)	9.374e+005	9.374e+005			
61	HHV Molar Basis (Std) (kJ/kgmole)	1.026e+006	1.026e+006			
62	HHV Mass Basis (Std) (kJ/kg)	4.762e+004	4.762e+004			
63	CO2 Loading	---	---			
64	CO2 Apparent Mole Conc. (kgmole/m3)	---	---			
65	CO2 Apparent Wt. Conc. (kgmol/kg)	---	---			
66	LHV Mass Basis (Std) (kJ/kg)	4.348e+004	4.348e+004			
67	Phase Fraction [Vol. Basis]	1.000	1.000			
68	Phase Fraction [Mass Basis]	1.000	1.000			
69	<div> <div>Aspen Technology Inc.</div> <div>Aspen HYSYS Version 11</div> <div>Page 18 of 39</div> </div>					


1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>			Case Name: BINAK WINTER-D03.hsc					
2				Unit Set: Binak3a1314					
3									
4				Date/Time: Mon Mar 7 12:14:35 2022					
5	<div>Material Stream: 08 (continued)</div>								
6								Fluid Package: Basis-1	
7								Property Package: Peng-Robinson	
8									
9	PROPERTIES								
10									
11		Overall	Vapour Phase						
12	Phase Fraction [Act. Vol. Basis]	1.000	1.000						
13	Mass Exergy (kJ/kg)	335.2	---						
14	Partial Pressure of CO2 (bar_g)	-0.5265	---						
15	Cost Based on Flow (Cost/s)	0.0000	0.0000						
16	Act. Gas Flow (ACT_m3/h)	479.8	479.8						
17	Avg. Liq. Density (kgmole/m3)	16.92	16.92						
18	Specific Heat (kJ/kgmole-C)	45.63	45.63						
19	Std. Gas Flow (Nm3/h)	7887	7887						
20	Std. Ideal Liq. Mass Density (kg/m3)	364.6	364.6						
21	Act. Liq. Flow (m3/s)	---	---						
22	Z Factor	0.9508	0.9508						
23	Watson K	17.21	17.21						
24	User Property	---	---						
25	Partial Pressure of H2S (bar_g)	-0.1045	---						
26	Cp/(Cp - R)	1.223	1.223						
27	Cp/Cv	1.296	1.296						
28	Heat of Vap. (kJ/kgmole)	1.426e+004	---						
29	Kinematic Viscosity (cSt)	0.8063	0.8063						
30	Liq. Mass Density (Std. Cond) (kg/m3)	0.9155	0.9155						
31	Liq. Vol. Flow (Std. Cond) (m3/h)	8285	8285						
32	Liquid Fraction	0.0000	0.0000						
33	Molar Volume (m3/kgmole)	1.364	1.364						
34	Mass Heat of Vap. (kJ/kg)	661.4	---						
35	Phase Fraction [Molar Basis]	1.0000	1.0000						
36	Surface Tension (dyne/cm)	---	---						
37	Thermal Conductivity (W/m-K)	3.513e-002	3.513e-002						
38	Viscosity (cP)	1.275e-002	1.275e-002						
39	Cv (Semi-Ideal) (kJ/kgmole-C)	37.32	37.32						
40	Mass Cv (Semi-Ideal) (kJ/kg-C)	1.731	1.731						
41	Cv (kJ/kgmole-C)	35.22	35.22						
42	Mass Cv (kJ/kg-C)	1.634	1.634						
43	Cv (Ent. Method) (kJ/kgmole-C)	---	---						
44	Mass Cv (Ent. Method) (kJ/kg-C)	---	---						
45	Cp/Cv (Ent. Method)	---	---						
46	Reid VP at 37.8 C (bar_g)	---	---						
47	True VP at 37.8 C (bar_g)	---	---						
48	Liq. Vol. Flow - Sum(Std. Cond) (m3/h)	8285	8285						
49	Viscosity Index	-28.69	---						
50	Ideal Gas Cp/Cv	1.238	1.238						
51	Ideal Gas Cp (kJ/kgmole-C)	43.25	43.25						
52	Mass Ideal Gas Cp (kJ/kg-C)	2.006	2.006						
53	Bubble Point Pressure (bar_g)	---	---						
54									
55	COMPOSITION								
56									
57	Overall Phase			Vapour Fraction 1.0000					
58	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION		
59									
60	H2O	1.2800	0.0036	23.0594	0.0030	0.0231	0.0011		
61	CO2	8.8679	0.0252	390.2723	0.0515	0.4729	0.0227		
62	H2S	16.5573	0.0471	564.2056	0.0744	0.7156	0.0344		
63	Methane	260.3140	0.7398	4176.1918	0.5506	13.9488	0.6706		
64	Ethane	40.2006	0.1142	1208.8272	0.1594	3.3986	0.1634		
65	Propane	16.6682	0.0474	735.0188	0.0969	1.4507	0.0697		
66	i-Butane	1.3872	0.0039	80.6310	0.0106	0.1435	0.0069		
67	n-Butane	2.8606	0.0081	166.2667	0.0219	0.2851	0.0137		
68	i-Pentane	1.0787	0.0031	77.8312	0.0103	0.1248	0.0060		
69	Aspen Technology Inc.			Aspen HYSYS Version 11		Page 19 of 39			


1	 <div> <div>Company Name Not Available</div> <div>Bedford, MA</div> <div>USA</div> </div>			Case Name: BINAK WINTER-D03.hsc		
2				Unit Set: Binak3a1314		
3				Date/Time: Mon Mar 7 12:14:35 2022		
4						
5	Material Stream: 08 (continued)					Fluid Package: Basis-1
6						Property Package: Peng-Robinson
7						
8	COMPOSITION					
9						
10	Overall Phase (continued)					
11						Vapour Fraction 1.0000
12						
13	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)
14						LIQUID VOLUME FRACTION
15	n-Pentane	0.5101	0.0014	36.8070	0.0049	0.0584
16	n-Hexane	0.7825	0.0022	67.4384	0.0089	0.1018
17	n-Heptane	0.1908	0.0005	19.1167	0.0025	0.0278
18	n-Octane	0.0526	0.0001	6.0046	0.0008	0.0085
19	n-Nonane	0.0250	0.0001	3.2039	0.0004	0.0044
20	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000
21	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000
22	Nitrogen	1.0912	0.0031	30.5685	0.0040	0.0379
23	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000
24	Total	351.8667	1.0000	7585.4428	1.0000	20.8020
25						
26	Vapour Phase					Phase Fraction 1.000
27	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)
28						LIQUID VOLUME FRACTION
29	H2O	1.2800	0.0036	23.0594	0.0030	0.0231
30	CO2	8.8679	0.0252	390.2723	0.0515	0.4729
31	H2S	16.5573	0.0471	564.2056	0.0744	0.7156
32	Methane	260.3140	0.7398	4176.1918	0.5506	13.9488
33	Ethane	40.2006	0.1142	1208.8272	0.1594	3.3986
34	Propane	16.6682	0.0474	735.0188	0.0969	1.4507
35	i-Butane	1.3872	0.0039	80.6310	0.0106	0.1435
36	n-Butane	2.8606	0.0081	166.2667	0.0219	0.2851
37	i-Pentane	1.0787	0.0031	77.8312	0.0103	0.1248
38	n-Pentane	0.5101	0.0014	36.8070	0.0049	0.0584
39	n-Hexane	0.7825	0.0022	67.4384	0.0089	0.1018
40	n-Heptane	0.1908	0.0005	19.1167	0.0025	0.0278
41	n-Octane	0.0526	0.0001	6.0046	0.0008	0.0085
42	n-Nonane	0.0250	0.0001	3.2039	0.0004	0.0044
43	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000
44	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000
45	Nitrogen	1.0912	0.0031	30.5685	0.0040	0.0379
46	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000
47	Total	351.8667	1.0000	7585.4428	1.0000	20.8020
48	Material Stream: 09					Fluid Package: Basis-1
49						Property Package: Peng-Robinson
50						
51	CONDITIONS					
52						
53		Overall	Vapour Phase	Aqueous Phase		
54	Vapour / Phase Fraction	1.0000	1.0000	0.0000		
55	Temperature: (C)	59.89	59.89	59.89		
56	Pressure: (bar_g)	18.10	18.10	18.10		
57	Molar Flow (MMSCFD)	7.065	7.065	0.0000		
58	Mass Flow (kg/h)	7585	7585	0.0000		
59	Std Ideal Liq Vol Flow (m3/h)	20.80	20.80	0.0000		
60	Molar Enthalpy (kJ/kgmole)	-8.351e+004	-8.351e+004	-2.829e+005		
61	Molar Entropy (kJ/kgmole-C)	170.4	170.4	62.62		
62	Heat Flow (kW)	-8163	-8163	0.0000		
63	Liq Vol Flow @Std Cond (m3/h)	8285 *	8285	0.0000		
64	PROPERTIES					
65						
66		Overall	Vapour Phase	Aqueous Phase		
67	Molecular Weight	21.56	21.56	18.06		
68	Molar Density (kgmole/m3)	0.7256	0.7256	45.93		
69	<div> <div>Aspen Technology Inc.</div> <div>Aspen HYSYS Version 11</div> <div>Page 20 of 39</div> </div>					


1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>		Case Name: BINAK WINTER-D03.hsc			
2			Unit Set: Binak3a1314			
3			Date/Time: Mon Mar 7 12:14:35 2022			
4						
5	<div>Material Stream: 09 (continued)</div>		Fluid Package: Basis-1			
6			Property Package: Peng-Robinson			
7						
8						
9	PROPERTIES					
10						
11		Overall	Vapour Phase	Aqueous Phase		
12	Mass Density (kg/m3)	15.64	15.64	829.6		
13	Act. Volume Flow (m3/h)	484.9	484.9	0.0000		
14	Mass Enthalpy (kJ/kg)	-3874	-3874	-1.566e+004		
15	Mass Entropy (kJ/kg-C)	7.905	7.905	3.467		
16	Heat Capacity (kJ/kgmole-C)	45.60	45.60	77.90		
17	Mass Heat Capacity (kJ/kg-C)	2.115	2.115	4.313		
18	LHV Molar Basis (Std) (kJ/kgmole)	9.374e+005	9.374e+005	1207		
19	HHV Molar Basis (Std) (kJ/kgmole)	1.026e+006	1.026e+006	4.220e+004		
20	HHV Mass Basis (Std) (kJ/kg)	4.762e+004	4.762e+004	2337		
21	CO2 Loading	---	---	---		
22	CO2 Apparent Mole Conc. (kgmole/m3)	---	---	---		
23	CO2 Apparent Wt. Conc. (kgmol/kg)	---	---	---		
24	LHV Mass Basis (Std) (kJ/kg)	4.348e+004	4.348e+004	66.84		
25	Phase Fraction [Vol. Basis]	1.000	1.000	---		
26	Phase Fraction [Mass Basis]	1.000	1.000	0.0000		
27	Phase Fraction [Act. Vol. Basis]	1.000	1.000	0.0000		
28	Mass Exergy (kJ/kg)	334.0	---	---		
29	Partial Pressure of CO2 (bar_g)	-0.5316	---	---		
30	Cost Based on Flow (Cost/s)	0.0000	0.0000	0.0000		
31	Act. Gas Flow (ACT_m3/h)	484.9	484.9	---		
32	Avg. Liq. Density (kgmole/m3)	16.92	16.92	55.18		
33	Specific Heat (kJ/kgmole-C)	45.60	45.60	77.90		
34	Std. Gas Flow (Nm3/h)	7887	7887	0.0000		
35	Std. Ideal Liq. Mass Density (kg/m3)	364.6	364.6	996.6		
36	Act. Liq. Flow (m3/s)	0.0000	---	0.0000		
37	Z Factor	---	0.9513	1.503e-002		
38	Watson K	17.21	17.21	9.099		
39	User Property	---	---	---		
40	Partial Pressure of H2S (bar_g)	-0.1139	---	---		
41	Cp/(Cp - R)	1.223	1.223	1.119		
42	Cp/Cv	1.295	1.295	1.164		
43	Heat of Vap. (kJ/kgmole)	1.428e+004	---	---		
44	Kinematic Viscosity (cSt)	0.8143	0.8143	0.5329		
45	Liq. Mass Density (Std. Cond) (kg/m3)	0.9155	0.9155	1014		
46	Liq. Vol. Flow (Std. Cond) (m3/h)	8285	8285	0.0000		
47	Liquid Fraction	0.0000	0.0000	1.000		
48	Molar Volume (m3/kgmole)	1.378	1.378	2.177e-002		
49	Mass Heat of Vap. (kJ/kg)	662.3	---	---		
50	Phase Fraction [Molar Basis]	1.0000	1.0000	0.0000		
51	Surface Tension (dyne/cm)	---	---	65.82		
52	Thermal Conductivity (W/m-K)	3.510e-002	3.510e-002	0.6510		
53	Viscosity (cP)	1.274e-002	1.274e-002	0.4421		
54	Cv (Semi-Ideal) (kJ/kgmole-C)	37.29	37.29	69.58		
55	Mass Cv (Semi-Ideal) (kJ/kg-C)	1.730	1.730	3.853		
56	Cv (kJ/kgmole-C)	35.21	35.21	66.91		
57	Mass Cv (kJ/kg-C)	1.633	1.633	3.704		
58	Cv (Ent. Method) (kJ/kgmole-C)	---	---	---		
59	Mass Cv (Ent. Method) (kJ/kg-C)	---	---	---		
60	Cp/Cv (Ent. Method)	---	---	---		
61	Reid VP at 37.8 C (bar_g)	---	---	35.66		
62	True VP at 37.8 C (bar_g)	---	---	54.27		
63	Liq. Vol. Flow - Sum(Std. Cond) (m3/h)	8285	8285	0.0000		
64	Viscosity Index	-28.50	---	---		
65	Ideal Gas Cp/Cv	1.238	1.238	1.326		
66	Ideal Gas Cp (kJ/kgmole-C)	43.24	43.24	33.79		
67	Mass Ideal Gas Cp (kJ/kg-C)	2.006	2.006	1.871		
68	Bubble Point Pressure (bar_g)	---	---	---		
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 21 of 39					


1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>				Case Name: BINAK WINTER-D03.hsc		
2					Unit Set: Binak3a1314		
3					Date/Time: Mon Mar 7 12:14:35 2022		
4							
5							
6	Material Stream: 09 (continued)				Fluid Package: Basis-1		
7					Property Package: Peng-Robinson		
8							
9	COMPOSITION						
10							
11	Overall Phase				Vapour Fraction		1.0000
12							
13	COMPONENTS	MOLAR FLOW	MOLE FRACTION	MASS FLOW	MASS FRACTION	LIQUID VOLUME	LIQUID VOLUME
14		(kgmole/h)		(kg/h)		FLOW (m3/h)	FRACTION
15	H2O	1.2800	0.0036	23.0594	0.0030	0.0231	0.0011
16	CO2	8.8679	0.0252	390.2723	0.0515	0.4729	0.0227
17	H2S	16.5573	0.0471	564.2056	0.0744	0.7156	0.0344
18	Methane	260.3140	0.7398	4176.1918	0.5506	13.9488	0.6706
19	Ethane	40.2006	0.1142	1208.8272	0.1594	3.3986	0.1634
20	Propane	16.6682	0.0474	735.0188	0.0969	1.4507	0.0697
21	i-Butane	1.3872	0.0039	80.6310	0.0106	0.1435	0.0069
22	n-Butane	2.8606	0.0081	166.2667	0.0219	0.2851	0.0137
23	i-Pentane	1.0787	0.0031	77.8312	0.0103	0.1248	0.0060
24	n-Pentane	0.5101	0.0014	36.8070	0.0049	0.0584	0.0028
25	n-Hexane	0.7825	0.0022	67.4384	0.0089	0.1018	0.0049
26	n-Heptane	0.1908	0.0005	19.1167	0.0025	0.0278	0.0013
27	n-Octane	0.0526	0.0001	6.0046	0.0008	0.0085	0.0004
28	n-Nonane	0.0250	0.0001	3.2039	0.0004	0.0044	0.0002
29	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
31	Nitrogen	1.0912	0.0031	30.5685	0.0040	0.0379	0.0018
32	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
33	Total	351.8667	1.0000	7585.4428	1.0000	20.8020	1.0000
34							
35	Vapour Phase				Phase Fraction		1.0000
36	COMPONENTS	MOLAR FLOW	MOLE FRACTION	MASS FLOW	MASS FRACTION	LIQUID VOLUME	LIQUID VOLUME
37		(kgmole/h)		(kg/h)		FLOW (m3/h)	FRACTION
38	H2O	1.2800	0.0036	23.0594	0.0030	0.0231	0.0011
39	CO2	8.8679	0.0252	390.2723	0.0515	0.4729	0.0227
40	H2S	16.5573	0.0471	564.2056	0.0744	0.7156	0.0344
41	Methane	260.3140	0.7398	4176.1918	0.5506	13.9488	0.6706
42	Ethane	40.2006	0.1142	1208.8272	0.1594	3.3986	0.1634
43	Propane	16.6682	0.0474	735.0188	0.0969	1.4507	0.0697
44	i-Butane	1.3872	0.0039	80.6310	0.0106	0.1435	0.0069
45	n-Butane	2.8606	0.0081	166.2667	0.0219	0.2851	0.0137
46	i-Pentane	1.0787	0.0031	77.8312	0.0103	0.1248	0.0060
47	n-Pentane	0.5101	0.0014	36.8070	0.0049	0.0584	0.0028
48	n-Hexane	0.7825	0.0022	67.4384	0.0089	0.1018	0.0049
49	n-Heptane	0.1908	0.0005	19.1167	0.0025	0.0278	0.0013
50	n-Octane	0.0526	0.0001	6.0046	0.0008	0.0085	0.0004
51	n-Nonane	0.0250	0.0001	3.2039	0.0004	0.0044	0.0002
52	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
53	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
54	Nitrogen	1.0912	0.0031	30.5685	0.0040	0.0379	0.0018
55	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
56	Total	351.8667	1.0000	7585.4428	1.0000	20.8020	1.0000
57							
58	Aqueous Phase				Phase Fraction		0.0000
59	COMPONENTS	MOLAR FLOW	MOLE FRACTION	MASS FLOW	MASS FRACTION	LIQUID VOLUME	LIQUID VOLUME
60		(kgmole/h)		(kg/h)		FLOW (m3/h)	FRACTION
61	H2O	0.0000	0.9973	0.0000	0.9948	0.0000	0.9934
62	CO2	0.0000	0.0003	0.0000	0.0008	0.0000	0.0010
63	H2S	0.0000	0.0023	0.0000	0.0044	0.0000	0.0056
64	Methane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
65	Ethane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
66	Propane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
67	i-Butane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
68	n-Butane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
69	Aspen Technology Inc.			Aspen HYSYS Version 11		Page 22 of 39	


1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>				Case Name: BINAK WINTER-D03.hsc			
2					Unit Set: Binak3a1314			
3								
4								
5	Date/Time: Mon Mar 7 12:14:35 2022							
6								
7								
8	Material Stream: 09 (continued)				Fluid Package: Basis-1			
9					Property Package: Peng-Robinson			
10								
11	COMPOSITION							
12	Aqueous Phase (continued)							
13							Phase Fraction	0.0000
14	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION	
15	i-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
16	n-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
17	n-Hexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
18	n-Heptane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
19	n-Octane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
20	n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
21	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
22	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
23	Nitrogen	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
24	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
25	Total	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000	
26	Material Stream: 10				Fluid Package: Basis-1			
27					Property Package: Peng-Robinson			
28								
29	CONDITIONS							
30								
31		Overall	Vapour Phase					
32	Vapour / Phase Fraction	1.0000	1.0000					
33	Temperature: (C)	149.5	149.5					
34	Pressure: (bar_g)	54.80 *	54.80					
35	Molar Flow (MMSCFD)	7.065	7.065					
36	Mass Flow (kg/h)	7585	7585					
37	Std Ideal Liq Vol Flow (m3/h)	20.80	20.80					
38	Molar Enthalpy (kJ/kgmole)	-7.977e+004	-7.977e+004					
39	Molar Entropy (kJ/kgmole-C)	171.9	171.9					
40	Heat Flow (kW)	-7797	-7797					
41	Liq Vol Flow @Std Cond (m3/h)	8285 *	8285					
42	PROPERTIES							
43								
44		Overall	Vapour Phase					
45	Molecular Weight	21.56	21.56					
46	Molar Density (kgmole/m3)	1.675	1.675					
47	Mass Density (kg/m3)	36.11	36.11					
48	Act. Volume Flow (m3/h)	210.0	210.0					
49	Mass Enthalpy (kJ/kg)	-3700	-3700					
50	Mass Entropy (kJ/kg-C)	7.974	7.974					
51	Heat Capacity (kJ/kgmole-C)	53.12	53.12					
52	Mass Heat Capacity (kJ/kg-C)	2.464	2.464					
53	LHV Molar Basis (Std) (kJ/kgmole)	9.374e+005	9.374e+005					
54	HHV Molar Basis (Std) (kJ/kgmole)	1.026e+006	1.026e+006					
55	HHV Mass Basis (Std) (kJ/kg)	4.762e+004	4.762e+004					
56	CO2 Loading	---	---					
57	CO2 Apparent Mole Conc. (kgmole/m3)	---	---					
58	CO2 Apparent Wt. Conc. (kgmol/kg)	---	---					
59	LHV Mass Basis (Std) (kJ/kg)	4.348e+004	4.348e+004					
60	Phase Fraction [Vol. Basis]	1.000	1.000					
61	Phase Fraction [Mass Basis]	1.000	1.000					
62	Phase Fraction [Act. Vol. Basis]	1.000	1.000					
63	Mass Exergy (kJ/kg)	487.2	---					
64	Partial Pressure of CO2 (bar_g)	0.3934	---					
65	Cost Based on Flow (Cost/s)	0.0000	0.0000					
66	Act. Gas Flow (ACT_m3/h)	210.0	210.0					
67	Avg. Liq. Density (kgmole/m3)	16.92	16.92					
68	Specific Heat (kJ/kgmole-C)	53.12	53.12					
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 23 of 39							


1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>			Case Name: BINAK WINTER-D03.hsc							
2											
3								Unit Set: Binak3a1314			
4								Date/Time: Mon Mar 7 12:14:35 2022			
5	<div>Material Stream: 10 (continued)</div>			Fluid Package: Basis-1							
6				Property Package: Peng-Robinson							
7											
8											
9	PROPERTIES										
10											
11		Overall	Vapour Phase								
12	Std. Gas Flow (Nm3/h)	7887	7887								
13	Std. Ideal Liq. Mass Density (kg/m3)	364.6	364.6								
14	Act. Liq. Flow (m3/s)	---	---								
15	Z Factor	0.9481	0.9481								
16	Watson K	17.21	17.21								
17	User Property	---	---								
18	Partial Pressure of H2S (bar_g)	1.613	---								
19	Cp/(Cp - R)	1.186	1.186								
20	Cp/Cv	1.281	1.281								
21	Heat of Vap. (kJ/kgmole)	1.101e+004	---								
22	Kinematic Viscosity (cSt)	0.4520	0.4520								
23	Liq. Mass Density (Std. Cond) (kg/m3)	0.9155	0.9155								
24	Liq. Vol. Flow (Std. Cond) (m3/h)	8285	8285								
25	Liquid Fraction	0.0000	0.0000								
26	Molar Volume (m3/kgmole)	0.5970	0.5970								
27	Mass Heat of Vap. (kJ/kg)	510.8	---								
28	Phase Fraction [Molar Basis]	1.0000	1.0000								
29	Surface Tension (dyne/cm)	---	---								
30	Thermal Conductivity (W/m-K)	5.006e-002	5.006e-002								
31	Viscosity (cP)	1.632e-002	1.632e-002								
32	Cv (Semi-Ideal) (kJ/kgmole-C)	44.81	44.81								
33	Mass Cv (Semi-Ideal) (kJ/kg-C)	2.079	2.079								
34	Cv (kJ/kgmole-C)	41.46	41.46								
35	Mass Cv (kJ/kg-C)	1.923	1.923								
36	Cv (Ent. Method) (kJ/kgmole-C)	---	---								
37	Mass Cv (Ent. Method) (kJ/kg-C)	---	---								
38	Cp/Cv (Ent. Method)	---	---								
39	Reid VP at 37.8 C (bar_g)	---	---								
40	True VP at 37.8 C (bar_g)	---	---								
41	Liq. Vol. Flow - Sum(Std. Cond) (m3/h)	8285	8285								
42	Viscosity Index	-38.31	---								
43	Ideal Gas Cp/Cv	1.203	1.203								
44	Ideal Gas Cp (kJ/kgmole-C)	49.22	49.22								
45	Mass Ideal Gas Cp (kJ/kg-C)	2.283	2.283								
46	Bubble Point Pressure (bar_g)	---	---								
47	COMPOSITION										
48											
49	Overall Phase Vapour Fraction 1.0000										
50											
51	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION				
52											
53	H2O	1.2800	0.0036	23.0594	0.0030	0.0231	0.0011				
54	CO2	8.8679	0.0252	390.2723	0.0515	0.4729	0.0227				
55	H2S	16.5573	0.0471	564.2056	0.0744	0.7156	0.0344				
56	Methane	260.3140	0.7398	4176.1918	0.5506	13.9488	0.6706				
57	Ethane	40.2006	0.1142	1208.8272	0.1594	3.3986	0.1634				
58	Propane	16.6682	0.0474	735.0188	0.0969	1.4507	0.0697				
59	i-Butane	1.3872	0.0039	80.6310	0.0106	0.1435	0.0069				
60	n-Butane	2.8606	0.0081	166.2667	0.0219	0.2851	0.0137				
61	i-Pentane	1.0787	0.0031	77.8312	0.0103	0.1248	0.0060				
62	n-Pentane	0.5101	0.0014	36.8070	0.0049	0.0584	0.0028				
63	n-Hexane	0.7825	0.0022	67.4384	0.0089	0.1018	0.0049				
64	n-Heptane	0.1908	0.0005	19.1167	0.0025	0.0278	0.0013				
65	n-Octane	0.0526	0.0001	6.0046	0.0008	0.0085	0.0004				
66	n-Nonane	0.0250	0.0001	3.2039	0.0004	0.0044	0.0002				
67	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
68	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				
69	Aspen Technology Inc.			Aspen HYSYS Version 11		Page 24 of 39					


1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>				Case Name: BINAK WINTER-D03.hsc					
2					Fluid Package: Basis-1					
3								Unit Set: Binak3a1314		
4								Date/Time: Mon Mar 7 12:14:35 2022		
5										
6	Material Stream: 10 (continued)				Fluid Package: Basis-1					
7					Property Package: Peng-Robinson					
8										
9	COMPOSITION									
10										
11	Overall Phase (continued)				Vapour Fraction 1.0000					
12										
13	COMPONENTS	MOLAR FLOW	MOLE FRACTION	MASS FLOW	MASS FRACTION	LIQUID VOLUME	LIQUID VOLUME			
14		(kgmole/h)		(kg/h)		FLOW (m3/h)	FRACTION			
15	Nitrogen	1.0912	0.0031	30.5685	0.0040	0.0379	0.0018			
16	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
17	Total	351.8667	1.0000	7585.4428	1.0000	20.8020	1.0000			
18										
19	Vapour Phase				Phase Fraction 1.000					
20	COMPONENTS	MOLAR FLOW	MOLE FRACTION	MASS FLOW	MASS FRACTION	LIQUID VOLUME	LIQUID VOLUME			
21		(kgmole/h)		(kg/h)		FLOW (m3/h)	FRACTION			
22	H2O	1.2800	0.0036	23.0594	0.0030	0.0231	0.0011			
23	CO2	8.8679	0.0252	390.2723	0.0515	0.4729	0.0227			
24	H2S	16.5573	0.0471	564.2056	0.0744	0.7156	0.0344			
25	Methane	260.3140	0.7398	4176.1918	0.5506	13.9488	0.6706			
26	Ethane	40.2006	0.1142	1208.8272	0.1594	3.3986	0.1634			
27	Propane	16.6682	0.0474	735.0188	0.0969	1.4507	0.0697			
28	i-Butane	1.3872	0.0039	80.6310	0.0106	0.1435	0.0069			
29	n-Butane	2.8606	0.0081	166.2667	0.0219	0.2851	0.0137			
30	i-Pentane	1.0787	0.0031	77.8312	0.0103	0.1248	0.0060			
31	n-Pentane	0.5101	0.0014	36.8070	0.0049	0.0584	0.0028			
32	n-Hexane	0.7825	0.0022	67.4384	0.0089	0.1018	0.0049			
33	n-Heptane	0.1908	0.0005	19.1167	0.0025	0.0278	0.0013			
34	n-Octane	0.0526	0.0001	6.0046	0.0008	0.0085	0.0004			
35	n-Nonane	0.0250	0.0001	3.2039	0.0004	0.0044	0.0002			
36	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
37	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
38	Nitrogen	1.0912	0.0031	30.5685	0.0040	0.0379	0.0018			
39	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
40	Total	351.8667	1.0000	7585.4428	1.0000	20.8020	1.0000			
41										
42	Material Stream: 11				Fluid Package: Basis-1					
43					Property Package: Peng-Robinson					
44										
45	CONDITIONS									
46		Overall	Vapour Phase							
47	Vapour / Phase Fraction	1.0000	1.0000							
48	Temperature: (C)	60.00 *	60.00							
49	Pressure: (bar_g)	54.10	54.10							
50	Molar Flow (MMSCFD)	7.065	7.065							
51	Mass Flow (kg/h)	7585	7585							
52	Std Ideal Liq Vol Flow (m3/h)	20.80	20.80							
53	Molar Enthalpy (kJ/kgmole)	-8.439e+004	-8.439e+004							
54	Molar Entropy (kJ/kgmole-C)	159.7	159.7							
55	Heat Flow (kW)	-8248	-8248							
56	Liq Vol Flow @Std Cond (m3/h)	8285 *	8285							
57										
58	PROPERTIES									
59		Overall	Vapour Phase							
60	Molecular Weight	21.56	21.56							
61	Molar Density (kgmole/m3)	2.292	2.292							
62	Mass Density (kg/m3)	49.41	49.41							
63	Act. Volume Flow (m3/h)	153.5	153.5							
64	Mass Enthalpy (kJ/kg)	-3914	-3914							
65	Mass Entropy (kJ/kg-C)	7.410	7.410							
66	Heat Capacity (kJ/kgmole-C)	51.31	51.31							
67	Mass Heat Capacity (kJ/kg-C)	2.380	2.380							
68	LHV Molar Basis (Std) (kJ/kgmole)	9.374e+005	9.374e+005							
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 25 of 39									


1	 <div> Company Name Not Available Bedford, MA USA </div>			Case Name: BINAK WINTER-D03.hsc		
2				Unit Set: Binak3a1314		
3				Date/Time: Mon Mar 7 12:14:35 2022		
4						
5	Material Stream: 11 (continued)				Fluid Package: Basis-1	
6					Property Package: Peng-Robinson	
7						
8						
9	PROPERTIES					
10		Overall	Vapour Phase			
11						
12	HHV Molar Basis (Std) (kJ/kgmole)	1.026e+006	1.026e+006			
13	HHV Mass Basis (Std) (kJ/kg)	4.762e+004	4.762e+004			
14	CO2 Loading	---	---			
15	CO2 Apparent Mole Conc. (kgmole/m3)	---	---			
16	CO2 Apparent Wt. Conc. (kgmol/kg)	---	---			
17	LHV Mass Basis (Std) (kJ/kg)	4.348e+004	4.348e+004			
18	Phase Fraction [Vol. Basis]	1.000	1.000			
19	Phase Fraction [Mass Basis]	1.000	1.000			
20	Phase Fraction [Act. Vol. Basis]	1.000	1.000			
21	Mass Exergy (kJ/kg)	441.3	---			
22	Partial Pressure of CO2 (bar_g)	0.3757	---			
23	Cost Based on Flow (Cost/s)	0.0000	0.0000			
24	Act. Gas Flow (ACT_m3/h)	153.5	153.5			
25	Avg. Liq. Density (kgmole/m3)	16.92	16.92			
26	Specific Heat (kJ/kgmole-C)	51.31	51.31			
27	Std. Gas Flow (Nm3/h)	7887	7887			
28	Std. Ideal Liq. Mass Density (kg/m3)	364.6	364.6			
29	Act. Liq. Flow (m3/s)	---	---			
30	Z Factor	0.8680	0.8680			
31	Watson K	17.21	17.21			
32	User Property	---	---			
33	Partial Pressure of H2S (bar_g)	1.580	---			
34	Cp/(Cp - R)	1.193	1.193			
35	Cp/Cv	1.434	1.434			
36	Heat of Vap. (kJ/kgmole)	1.107e+004	---			
37	Kinematic Viscosity (cSt)	0.2815	0.2815			
38	Liq. Mass Density (Std. Cond) (kg/m3)	0.9155	0.9155			
39	Liq. Vol. Flow (Std. Cond) (m3/h)	8285	8285			
40	Liquid Fraction	0.0000	0.0000			
41	Molar Volume (m3/kgmole)	0.4363	0.4363			
42	Mass Heat of Vap. (kJ/kg)	513.6	---			
43	Phase Fraction [Molar Basis]	1.0000	1.0000			
44	Surface Tension (dyne/cm)	---	---			
45	Thermal Conductivity (W/m-K)	3.860e-002	3.860e-002			
46	Viscosity (cP)	1.391e-002	1.391e-002			
47	Cv (Semi-Ideal) (kJ/kgmole-C)	42.99	42.99			
48	Mass Cv (Semi-Ideal) (kJ/kg-C)	1.994	1.994			
49	Cv (kJ/kgmole-C)	35.77	35.77			
50	Mass Cv (kJ/kg-C)	1.659	1.659			
51	Cv (Ent. Method) (kJ/kgmole-C)	---	---			
52	Mass Cv (Ent. Method) (kJ/kg-C)	---	---			
53	Cp/Cv (Ent. Method)	---	---			
54	Reid VP at 37.8 C (bar_g)	---	---			
55	True VP at 37.8 C (bar_g)	---	---			
56	Liq. Vol. Flow - Sum(Std. Cond) (m3/h)	8285	8285			
57	Viscosity Index	---	---			
58	Ideal Gas Cp/Cv	1.238	1.238			
59	Ideal Gas Cp (kJ/kgmole-C)	43.25	43.25			
60	Mass Ideal Gas Cp (kJ/kg-C)	2.006	2.006			
61	Bubble Point Pressure (bar_g)	---	---			
62	COMPOSITION					
63						
64	Overall Phase			Vapour Fraction 1.0000		
65						
66	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)
67						LIQUID VOLUME FRACTION
68	H2O	1.2800	0.0036	23.0594	0.0030	0.0231
69	Aspen Technology Inc.	Aspen HYSYS Version 11				Page 26 of 39


1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>				Case Name: BINAK WINTER-D03.hsc			
2					Unit Set: Binak3a1314			
3								
4								
5	Date/Time: Mon Mar 7 12:14:35 2022							
6								
7								
8	Material Stream: 11 (continued)				Fluid Package: Basis-1			
9					Property Package: Peng-Robinson			
10								
11	COMPOSITION							
12	Overall Phase (continued)							
13							Vapour Fraction	1.0000
14	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION	
15	CO2	8.8679	0.0252	390.2723	0.0515	0.4729	0.0227	
16	H2S	16.5573	0.0471	564.2056	0.0744	0.7156	0.0344	
17	Methane	260.3140	0.7398	4176.1918	0.5506	13.9488	0.6706	
18	Ethane	40.2006	0.1142	1208.8272	0.1594	3.3986	0.1634	
19	Propane	16.6682	0.0474	735.0188	0.0969	1.4507	0.0697	
20	i-Butane	1.3872	0.0039	80.6310	0.0106	0.1435	0.0069	
21	n-Butane	2.8606	0.0081	166.2667	0.0219	0.2851	0.0137	
22	i-Pentane	1.0787	0.0031	77.8312	0.0103	0.1248	0.0060	
23	n-Pentane	0.5101	0.0014	36.8070	0.0049	0.0584	0.0028	
24	n-Hexane	0.7825	0.0022	67.4384	0.0089	0.1018	0.0049	
25	n-Heptane	0.1908	0.0005	19.1167	0.0025	0.0278	0.0013	
26	n-Octane	0.0526	0.0001	6.0046	0.0008	0.0085	0.0004	
27	n-Nonane	0.0250	0.0001	3.2039	0.0004	0.0044	0.0002	
28	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
29	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
30	Nitrogen	1.0912	0.0031	30.5685	0.0040	0.0379	0.0018	
31	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
32	Total	351.8667	1.0000	7585.4428	1.0000	20.8020	1.0000	
33	Vapour Phase							
34							Phase Fraction	1.0000
35	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION	
36								
37	H2O	1.2800	0.0036	23.0594	0.0030	0.0231	0.0011	
38	CO2	8.8679	0.0252	390.2723	0.0515	0.4729	0.0227	
39	H2S	16.5573	0.0471	564.2056	0.0744	0.7156	0.0344	
40	Methane	260.3140	0.7398	4176.1918	0.5506	13.9488	0.6706	
41	Ethane	40.2006	0.1142	1208.8272	0.1594	3.3986	0.1634	
42	Propane	16.6682	0.0474	735.0188	0.0969	1.4507	0.0697	
43	i-Butane	1.3872	0.0039	80.6310	0.0106	0.1435	0.0069	
44	n-Butane	2.8606	0.0081	166.2667	0.0219	0.2851	0.0137	
45	i-Pentane	1.0787	0.0031	77.8312	0.0103	0.1248	0.0060	
46	n-Pentane	0.5101	0.0014	36.8070	0.0049	0.0584	0.0028	
47	n-Hexane	0.7825	0.0022	67.4384	0.0089	0.1018	0.0049	
48	n-Heptane	0.1908	0.0005	19.1167	0.0025	0.0278	0.0013	
49	n-Octane	0.0526	0.0001	6.0046	0.0008	0.0085	0.0004	
50	n-Nonane	0.0250	0.0001	3.2039	0.0004	0.0044	0.0002	
51	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
52	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
53	Nitrogen	1.0912	0.0031	30.5685	0.0040	0.0379	0.0018	
54	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
55	Total	351.8667	1.0000	7585.4428	1.0000	20.8020	1.0000	
56	Material Stream: 12							
57							Fluid Package: Basis-1	
58							Property Package: Peng-Robinson	
59	CONDITIONS							
60								
61		Overall	Vapour Phase					
62	Vapour / Phase Fraction	1.0000	1.0000					
63	Temperature: (C)	60.00	60.00					
64	Pressure: (bar_g)	54.10	54.10					
65	Molar Flow (MMSCFD)	14.13	14.13					
66	Mass Flow (kg/h)	1.517e+004	1.517e+004					
67	Std Ideal Liq Vol Flow (m3/h)	41.60	41.60					
68	Molar Enthalpy (kJ/kgmole)	-8.439e+004	-8.439e+004					
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 27 of 39							

1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>		Case Name: BINAK WINTER-D03.hsc		
2			Unit Set: Binak3a1314		
3					
4			Date/Time: Mon Mar 7 12:14:35 2022		
5	<div><div>Material Stream: 12 (continued)</div><div>Fluid Package: Basis-1 Property Package: Peng-Robinson</div></div>				
6					
7					
8					
9	CONDITIONS				
10					
11		Overall	Vapour Phase		
12	Molar Entropy (kJ/kgmole-C)	159.7	159.7		
13	Heat Flow (kW)	-1.650e+004	-1.650e+004		
14	Liq Vol Flow @Std Cond (m3/h)	1.657e+004 *	1.657e+004		
15	PROPERTIES				
16					
17		Overall	Vapour Phase		
18	Molecular Weight	21.56	21.56		
19	Molar Density (kgmole/m3)	2.292	2.292		
20	Mass Density (kg/m3)	49.41	49.41		
21	Act. Volume Flow (m3/h)	307.0	307.0		
22	Mass Enthalpy (kJ/kg)	-3914	-3914		
23	Mass Entropy (kJ/kg-C)	7.410	7.410		
24	Heat Capacity (kJ/kgmole-C)	51.31	51.31		
25	Mass Heat Capacity (kJ/kg-C)	2.380	2.380		
26	LHV Molar Basis (Std) (kJ/kgmole)	9.374e+005	9.374e+005		
27	HHV Molar Basis (Std) (kJ/kgmole)	1.026e+006	1.026e+006		
28	HHV Mass Basis (Std) (kJ/kg)	4.762e+004	4.762e+004		
29	CO2 Loading	---	---		
30	CO2 Apparent Mole Conc. (kgmole/m3)	---	---		
31	CO2 Apparent Wt. Conc. (kgmol/kg)	---	---		
32	LHV Mass Basis (Std) (kJ/kg)	4.348e+004	4.348e+004		
33	Phase Fraction [Vol. Basis]	1.000	1.000		
34	Phase Fraction [Mass Basis]	1.000	1.000		
35	Phase Fraction [Act. Vol. Basis]	1.000	1.000		
36	Mass Exergy (kJ/kg)	441.3	---		
37	Partial Pressure of CO2 (bar_g)	0.3757	---		
38	Cost Based on Flow (Cost/s)	0.0000	0.0000		
39	Act. Gas Flow (ACT_m3/h)	307.0	307.0		
40	Avg. Liq. Density (kgmole/m3)	16.92	16.92		
41	Specific Heat (kJ/kgmole-C)	51.31	51.31		
42	Std. Gas Flow (Nm3/h)	1.577e+004	1.577e+004		
43	Std. Ideal Liq. Mass Density (kg/m3)	364.6	364.6		
44	Act. Liq. Flow (m3/s)	---	---		
45	Z Factor	0.8680	0.8680		
46	Watson K	17.21	17.21		
47	User Property	---	---		
48	Partial Pressure of H2S (bar_g)	1.580	---		
49	Cp/(Cp - R)	1.193	1.193		
50	Cp/Cv	1.434	1.434		
51	Heat of Vap. (kJ/kgmole)	1.107e+004	---		
52	Kinematic Viscosity (cSt)	0.2815	0.2815		
53	Liq. Mass Density (Std. Cond) (kg/m3)	0.9155	0.9155		
54	Liq. Vol. Flow (Std. Cond) (m3/h)	1.657e+004	1.657e+004		
55	Liquid Fraction	0.0000	0.0000		
56	Molar Volume (m3/kgmole)	0.4363	0.4363		
57	Mass Heat of Vap. (kJ/kg)	513.6	---		
58	Phase Fraction [Molar Basis]	1.0000	1.0000		
59	Surface Tension (dyne/cm)	---	---		
60	Thermal Conductivity (W/m-K)	3.860e-002	3.860e-002		
61	Viscosity (cP)	1.391e-002	1.391e-002		
62	Cv (Semi-Ideal) (kJ/kgmole-C)	42.99	42.99		
63	Mass Cv (Semi-Ideal) (kJ/kg-C)	1.994	1.994		
64	Cv (kJ/kgmole-C)	35.77	35.77		
65	Mass Cv (kJ/kg-C)	1.659	1.659		
66	Cv (Ent. Method) (kJ/kgmole-C)	---	---		
67	Mass Cv (Ent. Method) (kJ/kg-C)	---	---		
68	Cp/Cv (Ent. Method)	---	---		
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 28 of 39				


1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>			Case Name: BINAK WINTER-D03.hsc					
2				Unit Set: Binak3a1314					
3									
4				Date/Time: Mon Mar 7 12:14:35 2022					
5	<div>Material Stream: 12 (continued)</div>								
6								Fluid Package: Basis-1	
7								Property Package: Peng-Robinson	
8									
9	PROPERTIES								
10									
11		Overall	Vapour Phase						
12	Reid VP at 37.8 C (bar_g)	---	---						
13	True VP at 37.8 C (bar_g)	---	---						
14	Liq. Vol. Flow - Sum(Std. Cond) (m3/h)	1.657e+004	1.657e+004						
15	Viscosity Index	---	---						
16	Ideal Gas Cp/Cv	1.238	1.238						
17	Ideal Gas Cp (kJ/kgmole-C)	43.25	43.25						
18	Mass Ideal Gas Cp (kJ/kg-C)	2.006	2.006						
19	Bubble Point Pressure (bar_g)	---	---						
20	COMPOSITION								
21									
22									
23	Overall Phase				Vapour Fraction 1.0000				
24	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION		
25									
26	H2O	2.5600	0.0036	46.1187	0.0030	0.0462	0.0011		
27	CO2	17.7357	0.0252	780.5445	0.0515	0.9457	0.0227		
28	H2S	33.1145	0.0471	1128.4112	0.0744	1.4313	0.0344		
29	Methane	520.6280	0.7398	8352.3835	0.5506	27.8976	0.6706		
30	Ethane	80.4011	0.1142	2417.6543	0.1594	6.7972	0.1634		
31	Propane	33.3365	0.0474	1470.0376	0.0969	2.9013	0.0697		
32	i-Butane	2.7744	0.0039	161.2619	0.0106	0.2870	0.0069		
33	n-Butane	5.7211	0.0081	332.5333	0.0219	0.5702	0.0137		
34	i-Pentane	2.1575	0.0031	155.6625	0.0103	0.2497	0.0060		
35	n-Pentane	1.0203	0.0014	73.6139	0.0049	0.1169	0.0028		
36	n-Hexane	1.5651	0.0022	134.8768	0.0089	0.2035	0.0049		
37	n-Heptane	0.3816	0.0005	38.2334	0.0025	0.0557	0.0013		
38	n-Octane	0.1051	0.0001	12.0092	0.0008	0.0170	0.0004		
39	n-Nonane	0.0500	0.0001	6.4077	0.0004	0.0089	0.0002		
40	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
41	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
42	Nitrogen	2.1825	0.0031	61.1370	0.0040	0.0758	0.0018		
43	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
44	Total	703.7334	1.0000	15170.8856	1.0000	41.6040	1.0000		
45	Vapour Phase								
46					Phase Fraction 1.000				
47	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION		
48									
49	H2O	2.5600	0.0036	46.1187	0.0030	0.0462	0.0011		
50	CO2	17.7357	0.0252	780.5445	0.0515	0.9457	0.0227		
51	H2S	33.1145	0.0471	1128.4112	0.0744	1.4313	0.0344		
52	Methane	520.6280	0.7398	8352.3835	0.5506	27.8976	0.6706		
53	Ethane	80.4011	0.1142	2417.6543	0.1594	6.7972	0.1634		
54	Propane	33.3365	0.0474	1470.0376	0.0969	2.9013	0.0697		
55	i-Butane	2.7744	0.0039	161.2619	0.0106	0.2870	0.0069		
56	n-Butane	5.7211	0.0081	332.5333	0.0219	0.5702	0.0137		
57	i-Pentane	2.1575	0.0031	155.6625	0.0103	0.2497	0.0060		
58	n-Pentane	1.0203	0.0014	73.6139	0.0049	0.1169	0.0028		
59	n-Hexane	1.5651	0.0022	134.8768	0.0089	0.2035	0.0049		
60	n-Heptane	0.3816	0.0005	38.2334	0.0025	0.0557	0.0013		
61	n-Octane	0.1051	0.0001	12.0092	0.0008	0.0170	0.0004		
62	n-Nonane	0.0500	0.0001	6.4077	0.0004	0.0089	0.0002		
63	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
64	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
65	Nitrogen	2.1825	0.0031	61.1370	0.0040	0.0758	0.0018		
66	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
67	Total	703.7334	1.0000	15170.8856	1.0000	41.6040	1.0000		
68									
69	Aspen Technology Inc.		Aspen HYSYS Version 11			Page 29 of 39			


1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>		Case Name: BINAK WINTER-D03.hsc		
2			Unit Set: Binak3a1314		
3			Date/Time: Mon Mar 7 12:14:35 2022		
4					
5					
6	Material Stream: 13			Fluid Package:	Basis-1
7				Property Package: Peng-Robinson	
8					
9	CONDITIONS				
10					
11		Overall	Vapour Phase	Aqueous Phase	
12	Vapour / Phase Fraction	1.0000	1.0000	0.0000	
13	Temperature: (C)	59.90	59.90	59.90	
14	Pressure: (bar_g)	53.90	53.90	53.90	
15	Molar Flow (MMSCFD)	14.13	14.13	0.0000	
16	Mass Flow (kg/h)	1.517e+004	1.517e+004	0.0000	
17	Std Ideal Liq Vol Flow (m3/h)	41.60	41.60	0.0000	
18	Molar Enthalpy (kJ/kgmole)	-8.439e+004	-8.439e+004	-2.829e+005	
19	Molar Entropy (kJ/kgmole-C)	159.8	159.8	62.53	
20	Heat Flow (kW)	-1.650e+004	-1.650e+004	0.0000	
21	Liq Vol Flow @Std Cond (m3/h)	1.657e+004 *	1.657e+004	0.0000	
22	PROPERTIES				
23					
24		Overall	Vapour Phase	Aqueous Phase	
25	Molecular Weight	21.56	21.56	18.06	
26	Molar Density (kgmole/m3)	2.284	2.284	45.97	
27	Mass Density (kg/m3)	49.23	49.23	830.0	
28	Act. Volume Flow (m3/h)	308.1	308.1	0.0000	
29	Mass Enthalpy (kJ/kg)	-3914	-3914	-1.567e+004	
30	Mass Entropy (kJ/kg-C)	7.411	7.411	3.463	
31	Heat Capacity (kJ/kgmole-C)	51.27	51.27	77.81	
32	Mass Heat Capacity (kJ/kg-C)	2.378	2.378	4.309	
33	LHV Molar Basis (Std) (kJ/kgmole)	9.374e+005	9.374e+005	1042	
34	HHV Molar Basis (Std) (kJ/kgmole)	1.026e+006	1.026e+006	4.204e+004	
35	HHV Mass Basis (Std) (kJ/kg)	4.762e+004	4.762e+004	2328	
36	CO2 Loading	---	---	---	
37	CO2 Apparent Mole Conc. (kgmole/m3)	---	---	---	
38	CO2 Apparent Wt. Conc. (kgmol/kg)	---	---	---	
39	LHV Mass Basis (Std) (kJ/kg)	4.348e+004	4.348e+004	57.70	
40	Phase Fraction [Vol. Basis]	1.000	1.000	---	
41	Phase Fraction [Mass Basis]	1.000	1.000	0.0000	
42	Phase Fraction [Act. Vol. Basis]	1.000	1.000	0.0000	
43	Mass Exergy (kJ/kg)	440.9	---	---	
44	Partial Pressure of CO2 (bar_g)	0.3707	---	---	
45	Cost Based on Flow (Cost/s)	0.0000	0.0000	0.0000	
46	Act. Gas Flow (ACT_m3/h)	308.1	308.1	---	
47	Avg. Liq. Density (kgmole/m3)	16.92	16.92	55.20	
48	Specific Heat (kJ/kgmole-C)	51.27	51.27	77.81	
49	Std. Gas Flow (Nm3/h)	1.577e+004	1.577e+004	0.0000	
50	Std. Ideal Liq. Mass Density (kg/m3)	364.6	364.6	996.8	
51	Act. Liq. Flow (m3/s)	0.0000	---	0.0000	
52	Z Factor	---	0.8683	4.314e-002	
53	Watson K	17.21	17.21	9.085	
54	User Property	---	---	---	
55	Partial Pressure of H2S (bar_g)	1.571	---	---	
56	Cp/(Cp - R)	1.194	1.194	1.120	
57	Cp/Cv	1.434	1.434	1.163	
58	Heat of Vap. (kJ/kgmole)	1.109e+004	---	---	
59	Kinematic Viscosity (cSt)	0.2823	0.2823	0.5331	
60	Liq. Mass Density (Std. Cond) (kg/m3)	0.9155	0.9155	1014	
61	Liq. Vol. Flow (Std. Cond) (m3/h)	1.657e+004	1.657e+004	0.0000	
62	Liquid Fraction	0.0000	0.0000	1.000	
63	Molar Volume (m3/kgmole)	0.4379	0.4379	2.175e-002	
64	Mass Heat of Vap. (kJ/kg)	514.5	---	---	
65	Phase Fraction [Molar Basis]	1.0000	1.0000	0.0000	
66	Surface Tension (dyne/cm)	---	---	65.83	
67	Thermal Conductivity (W/m-K)	3.857e-002	3.857e-002	0.6513	
68	Viscosity (cP)	1.390e-002	1.390e-002	0.4425	
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 30 of 39				


1	 <div> <div>Company Name Not Available</div> <div>Bedford, MA</div> <div>USA</div> </div>			Case Name: BINAK WINTER-D03.hsc		
2				Unit Set: Binak3a1314		
3				Date/Time: Mon Mar 7 12:14:35 2022		
4						
5	Material Stream: 13 (continued)				Fluid Package: Basis-1	
6					Property Package: Peng-Robinson	
7						
8						
9	PROPERTIES					
10		Overall	Vapour Phase	Aqueous Phase		
11						
12	Cv (Semi-Ideal) (kJ/kgmole-C)	42.96	42.96	69.49		
13	Mass Cv (Semi-Ideal) (kJ/kg-C)	1.993	1.993	3.849		
14	Cv (kJ/kgmole-C)	35.77	35.77	66.92		
15	Mass Cv (kJ/kg-C)	1.659	1.659	3.706		
16	Cv (Ent. Method) (kJ/kgmole-C)	---	---	---		
17	Mass Cv (Ent. Method) (kJ/kg-C)	---	---	---		
18	Cp/Cv (Ent. Method)	---	---	---		
19	Reid VP at 37.8 C (bar_g)	---	---	36.99		
20	True VP at 37.8 C (bar_g)	---	---	---		
21	Liq. Vol. Flow - Sum(Std. Cond) (m3/h)	1.657e+004	1.657e+004	0.0000		
22	Viscosity Index	---	---	---		
23	Ideal Gas Cp/Cv	1.238	1.238	1.326		
24	Ideal Gas Cp (kJ/kgmole-C)	43.24	43.24	33.79		
25	Mass Ideal Gas Cp (kJ/kg-C)	2.006	2.006	1.872		
26	Bubble Point Pressure (bar_g)	---	---	---		
27	COMPOSITION					
28						
29	Overall Phase					
30						Vapour Fraction 1.0000
31	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)
32						LIQUID VOLUME FRACTION
33	H2O	2.5600	0.0036	46.1187	0.0030	0.0462
34	CO2	17.7357	0.0252	780.5445	0.0515	0.9457
35	H2S	33.1145	0.0471	1128.4112	0.0744	1.4313
36	Methane	520.6280	0.7398	8352.3835	0.5506	27.8976
37	Ethane	80.4011	0.1142	2417.6543	0.1594	6.7972
38	Propane	33.3365	0.0474	1470.0376	0.0969	2.9013
39	i-Butane	2.7744	0.0039	161.2619	0.0106	0.2870
40	n-Butane	5.7211	0.0081	332.5333	0.0219	0.5702
41	i-Pentane	2.1575	0.0031	155.6625	0.0103	0.2497
42	n-Pentane	1.0203	0.0014	73.6139	0.0049	0.1169
43	n-Hexane	1.5651	0.0022	134.8768	0.0089	0.2035
44	n-Heptane	0.3816	0.0005	38.2334	0.0025	0.0557
45	n-Octane	0.1051	0.0001	12.0092	0.0008	0.0170
46	n-Nonane	0.0500	0.0001	6.4077	0.0004	0.0089
47	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000
48	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000
49	Nitrogen	2.1825	0.0031	61.1370	0.0040	0.0758
50	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000
51	Total	703.7334	1.0000	15170.8856	1.0000	41.6040
52	Vapour Phase					
53						Phase Fraction 1.000
54	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)
55						LIQUID VOLUME FRACTION
56	H2O	2.5600	0.0036	46.1187	0.0030	0.0462
57	CO2	17.7357	0.0252	780.5445	0.0515	0.9457
58	H2S	33.1145	0.0471	1128.4112	0.0744	1.4313
59	Methane	520.6280	0.7398	8352.3835	0.5506	27.8976
60	Ethane	80.4011	0.1142	2417.6543	0.1594	6.7972
61	Propane	33.3365	0.0474	1470.0376	0.0969	2.9013
62	i-Butane	2.7744	0.0039	161.2619	0.0106	0.2870
63	n-Butane	5.7211	0.0081	332.5333	0.0219	0.5702
64	i-Pentane	2.1575	0.0031	155.6625	0.0103	0.2497
65	n-Pentane	1.0203	0.0014	73.6139	0.0049	0.1169
66	n-Hexane	1.5651	0.0022	134.8768	0.0089	0.2035
67	n-Heptane	0.3816	0.0005	38.2334	0.0025	0.0557
68	n-Octane	0.1051	0.0001	12.0092	0.0008	0.0170
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 31 of 39					


1	 <div>Company Name Not Available Bedford, MA USA</div>			Case Name: BINAK WINTER-D03.hsc		
2				Unit Set: Binak3a1314		
3				Date/Time: Mon Mar 7 12:14:35 2022		
4						
5	Material Stream: 13 (continued)					Fluid Package: Basis-1
6						Property Package: Peng-Robinson
7						
8						
9	COMPOSITION					
10	Vapour Phase (continued)					
11						Phase Fraction 1.000
12						
13	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)
14						LIQUID VOLUME FRACTION
15	n-Nonane	0.0500	0.0001	6.4077	0.0004	0.0089
16	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000
17	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000
18	Nitrogen	2.1825	0.0031	61.1370	0.0040	0.0758
19	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000
20	Total	703.7334	1.0000	15170.8856	1.0000	41.6040
21	Aqueous Phase					Phase Fraction 0.0000
22						
23	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)
24						LIQUID VOLUME FRACTION
25	H2O	0.0000	0.9976	0.0000	0.9954	0.0000
26	CO2	0.0000	0.0003	0.0000	0.0008	0.0000
27	H2S	0.0000	0.0020	0.0000	0.0038	0.0000
28	Methane	0.0000	0.0000	0.0000	0.0000	0.0000
29	Ethane	0.0000	0.0000	0.0000	0.0000	0.0000
30	Propane	0.0000	0.0000	0.0000	0.0000	0.0000
31	i-Butane	0.0000	0.0000	0.0000	0.0000	0.0000
32	n-Butane	0.0000	0.0000	0.0000	0.0000	0.0000
33	i-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000
34	n-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000
35	n-Hexane	0.0000	0.0000	0.0000	0.0000	0.0000
36	n-Heptane	0.0000	0.0000	0.0000	0.0000	0.0000
37	n-Octane	0.0000	0.0000	0.0000	0.0000	0.0000
38	n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000
39	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000
40	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000
41	Nitrogen	0.0000	0.0000	0.0000	0.0000	0.0000
42	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000
43	Total	0.0000	1.0000	0.0000	1.0000	0.0000
44	Material Stream: 14					Fluid Package: Basis-1
45						Property Package: Peng-Robinson
46						
47						
48	CONDITIONS					
49		Overall	Vapour Phase			
50	Vapour / Phase Fraction	1.0000	1.0000			
51	Temperature: (C)	59.36	59.36			
52	Pressure: (bar_g)	52.90	52.90			
53	Molar Flow (MMSCFD)	14.07	14.07			
54	Mass Flow (kg/h)	1.511e+004	1.511e+004			
55	Std Ideal Liq Vol Flow (m3/h)	41.53	41.53			
56	Molar Enthalpy (kJ/kgmole)	-8.387e+004	-8.387e+004			
57	Molar Entropy (kJ/kgmole-C)	159.8	159.8			
58	Heat Flow (kW)	-1.632e+004	-1.632e+004			
59	Liq Vol Flow @Std Cond (m3/h)	1.650e+004 *	1.650e+004			
60	PROPERTIES					
61		Overall	Vapour Phase			
62						
63	Molecular Weight	21.56	21.56			
64	Molar Density (kgmole/m3)	2.242	2.242			
65	Mass Density (kg/m3)	48.32	48.32			
66	Act. Volume Flow (m3/h)	312.6	312.6			
67	Mass Enthalpy (kJ/kg)	-3891	-3891			
68	Mass Entropy (kJ/kg-C)	7.410	7.410			
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 32 of 39					


1	 <div>Company Name Not Available Bedford, MA USA</div>		Case Name: BINAK WINTER-D03.hsc	
2			Unit Set: Binak3a1314	
3			Date/Time: Mon Mar 7 12:14:35 2022	
4				
5			Fluid Package: Basis-1	
6	Material Stream: 14 (continued)		Property Package: Peng-Robinson	
7				
8				
9	PROPERTIES			
10				
11		Overall	Vapour Phase	
12	Heat Capacity (kJ/kgmole-C)	51.13	51.13	
13	Mass Heat Capacity (kJ/kg-C)	2.372	2.372	
14	LHV Molar Basis (Std) (kJ/kgmole)	9.408e+005	9.408e+005	
15	HHV Molar Basis (Std) (kJ/kgmole)	1.030e+006	1.030e+006	
16	HHV Mass Basis (Std) (kJ/kg)	4.778e+004	4.778e+004	
17	CO2 Loading	---	---	
18	CO2 Apparent Mole Conc. (kgmole/m3)	---	---	
19	CO2 Apparent Wt. Conc. (kgmol/kg)	---	---	
20	LHV Mass Basis (Std) (kJ/kg)	4.364e+004	4.364e+004	
21	Phase Fraction [Vol. Basis]	1.000	1.000	
22	Phase Fraction [Mass Basis]	1.000	1.000	
23	Phase Fraction [Act. Vol. Basis]	1.000	1.000	
24	Mass Exergy (kJ/kg)	439.1	---	
25	Partial Pressure of CO2 (bar_g)	0.3487	---	
26	Cost Based on Flow (Cost/s)	0.0000	0.0000	
27	Act. Gas Flow (ACT_m3/h)	312.6	312.6	
28	Avg. Liq. Density (kgmole/m3)	16.87	16.87	
29	Specific Heat (kJ/kgmole-C)	51.13	51.13	
30	Std. Gas Flow (Nm3/h)	1.570e+004	1.570e+004	
31	Std. Ideal Liq. Mass Density (kg/m3)	363.7	363.7	
32	Act. Liq. Flow (m3/s)	---	---	
33	Z Factor	0.8700	0.8700	
34	Watson K	17.22	17.22	
35	User Property	---	---	
36	Partial Pressure of H2S (bar_g)	1.499	---	
37	Cp/(Cp - R)	1.194	1.194	
38	Cp/Cv	1.430	1.430	
39	Heat of Vap. (kJ/kgmole)	9245	---	
40	Kinematic Viscosity (cSt)	0.2867	0.2867	
41	Liq. Mass Density (Std. Cond) (kg/m3)	0.9155	0.9155	
42	Liq. Vol. Flow (Std. Cond) (m3/h)	1.650e+004	1.650e+004	
43	Liquid Fraction	0.0000	0.0000	
44	Molar Volume (m3/kgmole)	0.4461	0.4461	
45	Mass Heat of Vap. (kJ/kg)	428.8	---	
46	Phase Fraction [Molar Basis]	1.0000	1.0000	
47	Surface Tension (dyne/cm)	---	---	
48	Thermal Conductivity (W/m-K)	3.844e-002	3.844e-002	
49	Viscosity (cP)	1.386e-002	1.386e-002	
50	Cv (Semi-Ideal) (kJ/kgmole-C)	42.81	42.81	
51	Mass Cv (Semi-Ideal) (kJ/kg-C)	1.986	1.986	
52	Cv (kJ/kgmole-C)	35.75	35.75	
53	Mass Cv (kJ/kg-C)	1.658	1.658	
54	Cv (Ent. Method) (kJ/kgmole-C)	---	---	
55	Mass Cv (Ent. Method) (kJ/kg-C)	---	---	
56	Cp/Cv (Ent. Method)	---	---	
57	Reid VP at 37.8 C (bar_g)	---	---	
58	True VP at 37.8 C (bar_g)	---	---	
59	Liq. Vol. Flow - Sum(Std. Cond) (m3/h)	1.650e+004	1.650e+004	
60	Viscosity Index	---	---	
61	Ideal Gas Cp/Cv	1.238	1.238	
62	Ideal Gas Cp (kJ/kgmole-C)	43.24	43.24	
63	Mass Ideal Gas Cp (kJ/kg-C)	2.006	2.006	
64	Bubble Point Pressure (bar_g)	---	---	
65				
66				
67				
68				
69	Aspen Technology Inc.		Aspen HYSYS Version 11	


1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>				Case Name: BINAK WINTER-D03.hsc		
2					Unit Set: Binak3a1314		
3							
4					Date/Time: Mon Mar 7 12:14:35 2022		
5							
6	Material Stream: 14 (continued)				Fluid Package: Basis-1		
7					Property Package: Peng-Robinson		
8							
9	COMPOSITION						
10							
11	Overall Phase Vapour Fraction 1.0000						
12							
13	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION
14							
15	H2O	0.1609	0.0002	2.8990	0.0002	0.0029	0.0001
16	CO2	17.7003	0.0253	778.9869	0.0516	0.9438	0.0227
17	H2S	32.6538	0.0466	1112.7121	0.0737	1.4113	0.0340
18	Methane	520.5587	0.7429	8351.2719	0.5529	27.8939	0.6717
19	Ethane	80.3813	0.1147	2417.0567	0.1600	6.7955	0.1636
20	Propane	33.3119	0.0475	1468.9561	0.0972	2.8992	0.0698
21	i-Butane	2.7617	0.0039	160.5214	0.0106	0.2856	0.0069
22	n-Butane	5.7157	0.0082	332.2198	0.0220	0.5696	0.0137
23	i-Pentane	2.1410	0.0031	154.4779	0.0102	0.2478	0.0060
24	n-Pentane	1.0183	0.0015	73.4708	0.0049	0.1167	0.0028
25	n-Hexane	1.5651	0.0022	134.8763	0.0089	0.2035	0.0049
26	n-Heptane	0.3816	0.0005	38.2333	0.0025	0.0557	0.0013
27	n-Octane	0.1051	0.0002	12.0092	0.0008	0.0170	0.0004
28	n-Nonane	0.0500	0.0001	6.4077	0.0004	0.0089	0.0002
29	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
31	Nitrogen	2.1823	0.0031	61.1326	0.0040	0.0758	0.0018
32	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
33	Total	700.6878	1.0000	15105.2316	1.0000	41.5274	1.0000
34							
35	Vapour Phase Phase Fraction 1.0000						
36	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION
37							
38	H2O	0.1609	0.0002	2.8990	0.0002	0.0029	0.0001
39	CO2	17.7003	0.0253	778.9869	0.0516	0.9438	0.0227
40	H2S	32.6538	0.0466	1112.7121	0.0737	1.4113	0.0340
41	Methane	520.5587	0.7429	8351.2719	0.5529	27.8939	0.6717
42	Ethane	80.3813	0.1147	2417.0567	0.1600	6.7955	0.1636
43	Propane	33.3119	0.0475	1468.9561	0.0972	2.8992	0.0698
44	i-Butane	2.7617	0.0039	160.5214	0.0106	0.2856	0.0069
45	n-Butane	5.7157	0.0082	332.2198	0.0220	0.5696	0.0137
46	i-Pentane	2.1410	0.0031	154.4779	0.0102	0.2478	0.0060
47	n-Pentane	1.0183	0.0015	73.4708	0.0049	0.1167	0.0028
48	n-Hexane	1.5651	0.0022	134.8763	0.0089	0.2035	0.0049
49	n-Heptane	0.3816	0.0005	38.2333	0.0025	0.0557	0.0013
50	n-Octane	0.1051	0.0002	12.0092	0.0008	0.0170	0.0004
51	n-Nonane	0.0500	0.0001	6.4077	0.0004	0.0089	0.0002
52	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
53	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
54	Nitrogen	2.1823	0.0031	61.1326	0.0040	0.0758	0.0018
55	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
56	Total	700.6878	1.0000	15105.2316	1.0000	41.5274	1.0000
57							
58	Material Stream: 15				Fluid Package: Basis-1		
59					Property Package: Peng-Robinson		
60							
61	CONDITIONS						
62		Overall	Vapour Phase				
63	Vapour / Phase Fraction	1.0000	1.0000				
64	Temperature: (C)	57.74	57.74				
65	Pressure: (bar_g)	49.56 *	49.56				
66	Molar Flow (MMSCFD)	14.07	14.07				
67	Mass Flow (kg/h)	1.511e+004	1.511e+004				
68	Std Ideal Liq Vol Flow (m3/h)	41.53	41.53				
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 34 of 39						
	Licensed to: Company Name Not Available * Specified by user.						

1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>		Case Name: BINAK WINTER-D03.hsc		
2			Unit Set: Binak3a1314		
3					
4					
5	Date/Time: Mon Mar 7 12:14:35 2022				
6					
7					
8	Material Stream: 15 (continued)			Fluid Package: Basis-1	
9				Property Package: Peng-Robinson	
10					
11	CONDITIONS				
12		Overall	Vapour Phase		
13	Molar Enthalpy (kJ/kgmole)	-8.387e+004	-8.387e+004		
14	Molar Entropy (kJ/kgmole-C)	160.2	160.2		
15	Heat Flow (kW)	-1.632e+004	-1.632e+004		
16	Liq Vol Flow @Std Cond (m3/h)	1.650e+004 *	1.650e+004		
17	PROPERTIES				
18		Overall	Vapour Phase		
19	Molecular Weight	21.56	21.56		
20	Molar Density (kgmole/m3)	2.101	2.101		
21	Mass Density (kg/m3)	45.29	45.29		
22	Act. Volume Flow (m3/h)	333.5	333.5		
23	Mass Enthalpy (kJ/kg)	-3891	-3891		
24	Mass Entropy (kJ/kg-C)	7.432	7.432		
25	Heat Capacity (kJ/kgmole-C)	50.56	50.56		
26	Mass Heat Capacity (kJ/kg-C)	2.345	2.345		
27	LHV Molar Basis (Std) (kJ/kgmole)	9.408e+005	9.408e+005		
28	HHV Molar Basis (Std) (kJ/kgmole)	1.030e+006	1.030e+006		
29	HHV Mass Basis (Std) (kJ/kg)	4.778e+004	4.778e+004		
30	CO2 Loading	---	---		
31	CO2 Apparent Mole Conc. (kgmole/m3)	---	---		
32	CO2 Apparent Wt. Conc. (kgmol/kg)	---	---		
33	LHV Mass Basis (Std) (kJ/kg)	4.364e+004	4.364e+004		
34	Phase Fraction [Vol. Basis]	1.000	1.000		
35	Phase Fraction [Mass Basis]	1.000	1.000		
36	Phase Fraction [Act. Vol. Basis]	1.000	1.000		
37	Mass Exergy (kJ/kg)	432.7	---		
38	Partial Pressure of CO2 (bar_g)	0.2643	---		
39	Cost Based on Flow (Cost/s)	0.0000	0.0000		
40	Act. Gas Flow (ACT_m3/h)	333.5	333.5		
41	Avg. Liq. Density (kgmole/m3)	16.87	16.87		
42	Specific Heat (kJ/kgmole-C)	50.56	50.56		
43	Std. Gas Flow (Nm3/h)	1.570e+004	1.570e+004		
44	Std. Ideal Liq. Mass Density (kg/m3)	363.7	363.7		
45	Act. Liq. Flow (m3/s)	---	---		
46	Z Factor	0.8749	0.8749		
47	Watson K	17.22	17.22		
48	User Property	---	---		
49	Partial Pressure of H2S (bar_g)	1.344	---		
50	Cp/(Cp - R)	1.197	1.197		
51	Cp/Cv	1.420	1.420		
52	Heat of Vap. (kJ/kgmole)	9640	---		
53	Kinematic Viscosity (cSt)	0.3021	0.3021		
54	Liq. Mass Density (Std. Cond) (kg/m3)	0.9155	0.9155		
55	Liq. Vol. Flow (Std. Cond) (m3/h)	1.650e+004	1.650e+004		
56	Liquid Fraction	0.0000	0.0000		
57	Molar Volume (m3/kgmole)	0.4759	0.4759		
58	Mass Heat of Vap. (kJ/kg)	447.2	---		
59	Phase Fraction [Molar Basis]	1.0000	1.0000		
60	Surface Tension (dyne/cm)	---	---		
61	Thermal Conductivity (W/m-K)	3.789e-002	3.789e-002		
62	Viscosity (cP)	1.368e-002	1.368e-002		
63	Cv (Semi-Ideal) (kJ/kgmole-C)	42.24	42.24		
64	Mass Cv (Semi-Ideal) (kJ/kg-C)	1.960	1.960		
65	Cv (kJ/kgmole-C)	35.60	35.60		
66	Mass Cv (kJ/kg-C)	1.652	1.652		
67	Cv (Ent. Method) (kJ/kgmole-C)	---	---		
68	Mass Cv (Ent. Method) (kJ/kg-C)	---	---		
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 35 of 39				

1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>			Case Name: BINAK WINTER-D03.hsc				
2				Unit Set: Binak3a1314				
3								
4				Date/Time: Mon Mar 7 12:14:35 2022				
5	<div>Material Stream: 15 (continued)</div>							
6								Fluid Package: Basis-1
7								Property Package: Peng-Robinson
8								
9	PROPERTIES							
10								
11		Overall	Vapour Phase					
12	Cp/Cv (Ent. Method)	---	---					
13	Reid VP at 37.8 C (bar_g)	---	---					
14	True VP at 37.8 C (bar_g)	---	---					
15	Liq. Vol. Flow - Sum(Std. Cond) (m3/h)	1.650e+004	1.650e+004					
16	Viscosity Index	---	---					
17	Ideal Gas Cp/Cv	1.239	1.239					
18	Ideal Gas Cp (kJ/kgmole-C)	43.14	43.14					
19	Mass Ideal Gas Cp (kJ/kg-C)	2.001	2.001					
20	Bubble Point Pressure (bar_g)	---	---					
21								
22	COMPOSITION							
23								
24	Overall Phase					Vapour Fraction	1.0000	
25	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION	
26								
27	H2O	0.1609	0.0002	2.8990	0.0002	0.0029	0.0001	
28	CO2	17.7003	0.0253	778.9869	0.0516	0.9438	0.0227	
29	H2S	32.6538	0.0466	1112.7121	0.0737	1.4113	0.0340	
30	Methane	520.5587	0.7429	8351.2719	0.5529	27.8939	0.6717	
31	Ethane	80.3813	0.1147	2417.0567	0.1600	6.7955	0.1636	
32	Propane	33.3119	0.0475	1468.9561	0.0972	2.8992	0.0698	
33	i-Butane	2.7617	0.0039	160.5214	0.0106	0.2856	0.0069	
34	n-Butane	5.7157	0.0082	332.2198	0.0220	0.5696	0.0137	
35	i-Pentane	2.1410	0.0031	154.4779	0.0102	0.2478	0.0060	
36	n-Pentane	1.0183	0.0015	73.4708	0.0049	0.1167	0.0028	
37	n-Hexane	1.5651	0.0022	134.8763	0.0089	0.2035	0.0049	
38	n-Heptane	0.3816	0.0005	38.2333	0.0025	0.0557	0.0013	
39	n-Octane	0.1051	0.0002	12.0092	0.0008	0.0170	0.0004	
40	n-Nonane	0.0500	0.0001	6.4077	0.0004	0.0089	0.0002	
41	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
42	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
43	Nitrogen	2.1823	0.0031	61.1326	0.0040	0.0758	0.0018	
44	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
45	Total	700.6878	1.0000	15105.2316	1.0000	41.5274	1.0000	
46								
47	Vapour Phase					Phase Fraction	1.000	
48	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)	LIQUID VOLUME FRACTION	
49								
50	H2O	0.1609	0.0002	2.8990	0.0002	0.0029	0.0001	
51	CO2	17.7003	0.0253	778.9869	0.0516	0.9438	0.0227	
52	H2S	32.6538	0.0466	1112.7121	0.0737	1.4113	0.0340	
53	Methane	520.5587	0.7429	8351.2719	0.5529	27.8939	0.6717	
54	Ethane	80.3813	0.1147	2417.0567	0.1600	6.7955	0.1636	
55	Propane	33.3119	0.0475	1468.9561	0.0972	2.8992	0.0698	
56	i-Butane	2.7617	0.0039	160.5214	0.0106	0.2856	0.0069	
57	n-Butane	5.7157	0.0082	332.2198	0.0220	0.5696	0.0137	
58	i-Pentane	2.1410	0.0031	154.4779	0.0102	0.2478	0.0060	
59	n-Pentane	1.0183	0.0015	73.4708	0.0049	0.1167	0.0028	
60	n-Hexane	1.5651	0.0022	134.8763	0.0089	0.2035	0.0049	
61	n-Heptane	0.3816	0.0005	38.2333	0.0025	0.0557	0.0013	
62	n-Octane	0.1051	0.0002	12.0092	0.0008	0.0170	0.0004	
63	n-Nonane	0.0500	0.0001	6.4077	0.0004	0.0089	0.0002	
64	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
65	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
66	Nitrogen	2.1823	0.0031	61.1326	0.0040	0.0758	0.0018	
67	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
68	Total	700.6878	1.0000	15105.2316	1.0000	41.5274	1.0000	
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 36 of 39							

1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>		Case Name: BINAK WINTER-D03.hsc		
2			Unit Set: Binak3a1314		
3					
4					
5	Date/Time: Mon Mar 7 12:14:35 2022				
6	Material Stream: 16		Fluid Package: Basis-1		
7			Property Package: Peng-Robinson		
8					
9	CONDITIONS				
10					
11		Overall	Vapour Phase	Aqueous Phase	
12	Vapour / Phase Fraction	1.0000	1.0000	0.0000	
13	Temperature: (C)	19.02	19.02	19.02	
14	Pressure: (bar_g)	5.100	5.100	5.100	
15	Molar Flow (MMSCFD)	0.4710	0.4710	0.0000	
16	Mass Flow (kg/h)	505.8 *	505.8	0.0000	
17	Std Ideal Liq Vol Flow (m3/h)	1.387	1.387	0.0000	
18	Molar Enthalpy (kJ/kgmole)	-8.495e+004	-8.495e+004	-2.866e+005	
19	Molar Entropy (kJ/kgmole-C)	174.9	174.9	52.20	
20	Heat Flow (kW)	-553.7	-553.7	0.0000	
21	Liq Vol Flow @Std Cond (m3/h)	552.4 *	552.4	0.0000	
22	PROPERTIES				
23					
24		Overall	Vapour Phase	Aqueous Phase	
25	Molecular Weight	21.56	21.56	18.02	
26	Molar Density (kgmole/m3)	0.2578	0.2578	56.14	
27	Mass Density (kg/m3)	5.559	5.559	1012	
28	Act. Volume Flow (m3/h)	90.99	90.99	0.0000	
29	Mass Enthalpy (kJ/kg)	-3941	-3941	-1.590e+004	
30	Mass Entropy (kJ/kg-C)	8.115	8.115	2.896	
31	Heat Capacity (kJ/kgmole-C)	41.77	41.77	77.70	
32	Mass Heat Capacity (kJ/kg-C)	1.937	1.937	4.311	
33	LHV Molar Basis (Std) (kJ/kgmole)	9.374e+005	9.374e+005	241.2	
34	HHV Molar Basis (Std) (kJ/kgmole)	1.026e+006	1.026e+006	4.125e+004	
35	HHV Mass Basis (Std) (kJ/kg)	4.762e+004	4.762e+004	2288	
36	CO2 Loading	---	---	---	
37	CO2 Apparent Mole Conc. (kgmole/m3)	---	---	---	
38	CO2 Apparent Wt. Conc. (kgmol/kg)	---	---	---	
39	LHV Mass Basis (Std) (kJ/kg)	4.348e+004	4.348e+004	13.38	
40	Phase Fraction [Vol. Basis]	1.000	1.000	---	
41	Phase Fraction [Mass Basis]	1.000	1.000	0.0000	
42	Phase Fraction [Act. Vol. Basis]	1.000	1.000	0.0000	
43	Mass Exergy (kJ/kg)	204.6	---	---	
44	Partial Pressure of CO2 (bar_g)	-0.8592	---	---	
45	Cost Based on Flow (Cost/s)	0.0000	0.0000	0.0000	
46	Act. Gas Flow (ACT_m3/h)	90.99	90.99	---	
47	Avg. Liq. Density (kgmole/m3)	16.92	16.92	55.35	
48	Specific Heat (kJ/kgmole-C)	41.77	41.77	77.70	
49	Std. Gas Flow (Nm3/h)	525.9	525.9	0.0000	
50	Std. Ideal Liq. Mass Density (kg/m3)	364.6	364.6	997.7	
51	Act. Liq. Flow (m3/s)	0.0000	---	0.0000	
52	Z Factor	---	0.9760	4.483e-003	
53	Watson K	17.21	17.21	9.080	
54	User Property	---	---	---	
55	Partial Pressure of H2S (bar_g)	-0.7256	---	---	
56	Cp/(Cp - R)	1.249	1.249	1.120	
57	Cp/Cv	1.281	1.281	1.143	
58	Heat of Vap. (kJ/kgmole)	1.572e+004	---	---	
59	Kinematic Viscosity (cSt)	1.985	1.985	1.014	
60	Liq. Mass Density (Std. Cond) (kg/m3)	0.9155	0.9155	1015	
61	Liq. Vol. Flow (Std. Cond) (m3/h)	552.4	552.4	0.0000	
62	Liquid Fraction	0.0000	0.0000	1.000	
63	Molar Volume (m3/kgmole)	3.878	3.878	1.781e-002	
64	Mass Heat of Vap. (kJ/kg)	729.4	---	---	
65	Phase Fraction [Molar Basis]	1.0000	1.0000	0.0000	
66	Surface Tension (dyne/cm)	---	---	73.10	
67	Thermal Conductivity (W/m-K)	2.867e-002	2.867e-002	0.6018	
68	Viscosity (cP)	1.103e-002	1.103e-002	1.026	
69	Aspen Technology Inc. Aspen HYSYS Version 11 Page 37 of 39				

1	 <div> <div>Company Name Not Available</div> <div>Bedford, MA</div> <div>USA</div> </div>			Case Name: BINAK WINTER-D03.hsc		
2				Unit Set: Binak3a1314		
3				Date/Time: Mon Mar 7 12:14:35 2022		
4						
5	Material Stream: 16 (continued)				Fluid Package: Basis-1	
6					Property Package: Peng-Robinson	
7						
8						
9	PROPERTIES					
10		Overall	Vapour Phase	Aqueous Phase		
11						
12	Cv (Semi-Ideal) (kJ/kgmole-C)	33.45	33.45	69.39		
13	Mass Cv (Semi-Ideal) (kJ/kg-C)	1.552	1.552	3.850		
14	Cv (kJ/kgmole-C)	32.60	32.60	67.97		
15	Mass Cv (kJ/kg-C)	1.512	1.512	3.771		
16	Cv (Ent. Method) (kJ/kgmole-C)	---	---	67.69		
17	Mass Cv (Ent. Method) (kJ/kg-C)	---	---	3.755		
18	Cp/Cv (Ent. Method)	---	---	1.148		
19	Reid VP at 37.8 C (bar_g)	---	---	37.07		
20	True VP at 37.8 C (bar_g)	---	---	-0.2967		
21	Liq. Vol. Flow - Sum(Std. Cond) (m3/h)	552.4	552.4	0.0000		
22	Viscosity Index	-17.42	---	---		
23	Ideal Gas Cp/Cv	1.256	1.256	1.330		
24	Ideal Gas Cp (kJ/kgmole-C)	40.81	40.81	33.55		
25	Mass Ideal Gas Cp (kJ/kg-C)	1.893	1.893	1.861		
26	Bubble Point Pressure (bar_g)	178.0	---	---		
27						
28	COMPOSITION					
29						
30	Overall Phase			Vapour Fraction	1.0000	
31	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)
32						LIQUID VOLUME FRACTION
33	H2O	0.0853	0.0036	1.5375	0.0030	0.0015
34	CO2	0.5913	0.0252	26.0220	0.0515	0.0315
35	H2S	1.1040	0.0471	37.6192	0.0744	0.0477
36	Methane	17.3568	0.7398	278.4536	0.5506	0.9301
37	Ethane	2.6804	0.1142	80.6003	0.1594	0.2266
38	Propane	1.1114	0.0474	49.0084	0.0969	0.0967
39	i-Butane	0.0925	0.0039	5.3762	0.0106	0.0096
40	n-Butane	0.1907	0.0081	11.0861	0.0219	0.0190
41	i-Pentane	0.0719	0.0031	5.1895	0.0103	0.0083
42	n-Pentane	0.0340	0.0014	2.4542	0.0049	0.0039
43	n-Hexane	0.0522	0.0022	4.4966	0.0089	0.0068
44	n-Heptane	0.0127	0.0005	1.2746	0.0025	0.0019
45	n-Octane	0.0035	0.0001	0.4004	0.0008	0.0006
46	n-Nonane	0.0017	0.0001	0.2136	0.0004	0.0003
47	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000
48	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000
49	Nitrogen	0.0728	0.0031	2.0382	0.0040	0.0025
50	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000
51	Total	23.4612	1.0000	505.7703	1.0000	1.3870
52						
53	Vapour Phase			Phase Fraction	1.000	
54	COMPONENTS	MOLAR FLOW (kgmole/h)	MOLE FRACTION	MASS FLOW (kg/h)	MASS FRACTION	LIQUID VOLUME FLOW (m3/h)
55						LIQUID VOLUME FRACTION
56	H2O	0.0853	0.0036	1.5375	0.0030	0.0015
57	CO2	0.5913	0.0252	26.0220	0.0515	0.0315
58	H2S	1.1040	0.0471	37.6192	0.0744	0.0477
59	Methane	17.3568	0.7398	278.4536	0.5506	0.9301
60	Ethane	2.6804	0.1142	80.6003	0.1594	0.2266
61	Propane	1.1114	0.0474	49.0084	0.0969	0.0967
62	i-Butane	0.0925	0.0039	5.3762	0.0106	0.0096
63	n-Butane	0.1907	0.0081	11.0861	0.0219	0.0190
64	i-Pentane	0.0719	0.0031	5.1895	0.0103	0.0083
65	n-Pentane	0.0340	0.0014	2.4542	0.0049	0.0039
66	n-Hexane	0.0522	0.0022	4.4966	0.0089	0.0068
67	n-Heptane	0.0127	0.0005	1.2746	0.0025	0.0019
68	n-Octane	0.0035	0.0001	0.4004	0.0008	0.0006
69						

1	<div></div> <div>Company Name Not Available Bedford, MA USA</div>				Case Name: BINAK WINTER-D03.hsc					
2					Fluid Package: Basis-1					
3								Unit Set: Binak3a1314		
4								Date/Time: Mon Mar 7 12:14:35 2022		
5										
6	Material Stream: 16 (continued)				Fluid Package: Basis-1					
7					Property Package: Peng-Robinson					
8										
9	COMPOSITION									
10										
11	Vapour Phase (continued)				Phase Fraction 1.000					
12										
13	COMPONENTS	MOLAR FLOW	MOLE FRACTION	MASS FLOW	MASS FRACTION	LIQUID VOLUME	LIQUID VOLUME			
14		(kgmole/h)		(kg/h)		FLOW (m3/h)	FRACTION			
15	n-Nonane	0.0017	0.0001	0.2136	0.0004	0.0003	0.0002			
16	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
17	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
18	Nitrogen	0.0728	0.0031	2.0382	0.0040	0.0025	0.0018			
19	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
20	Total	23.4612	1.0000	505.7703	1.0000	1.3870	1.0000			
21										
22	Aqueous Phase				Phase Fraction 0.0000					
23	COMPONENTS	MOLAR FLOW	MOLE FRACTION	MASS FLOW	MASS FRACTION	LIQUID VOLUME	LIQUID VOLUME			
24		(kgmole/h)		(kg/h)		FLOW (m3/h)	FRACTION			
25	H2O	0.0000	0.9995	0.0000	0.9989	0.0000	0.9986			
26	CO2	0.0000	0.0001	0.0000	0.0002	0.0000	0.0002			
27	H2S	0.0000	0.0005	0.0000	0.0009	0.0000	0.0011			
28	Methane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
29	Ethane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
30	Propane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
31	i-Butane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
32	n-Butane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
33	i-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
34	n-Pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
35	n-Hexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
36	n-Heptane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
37	n-Octane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
38	n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
39	n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
40	n-C11	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
41	Nitrogen	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
42	TEGlycol	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
43	Total	0.0000	1.0000	0.0000	1.0000	0.0000	1.0000			
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69	Aspen Technology Inc.		Aspen HYSYS Version 11			Page 39 of 39				