Table G.1. The physical characteristics of the membrane carbonized at 600 ^{o}C

Carbonization condition	Characteristics of carbonized membrane
- Furnace temperature was quickly increasing to 600 ^{o}C - leaved for 2 hours	Thin, flat, black color and very brittle
- Furnace temperature was quickly increasing to 600 ^{o}C - leaved for 20 minutes	Smooth, dark brown with some black spots color. This was likely because membrane was not completely and not enough time for carbonized membrane.
- Furnace temperature was first increased from room temperature to 100 °C and then increased stepwise, 50 °C for each step until the temperature reached 600 °C - leaved for 15 minutes - cylindrical chamber are height from bottom of the furnace over 11 cm.	Smooth, dark brown with some black spots color. Membrane was not completely carbonized. Because cylindrical chamber not enough depth and heat for carbonized membrane.
- Furnace temperature was first increased from room temperature to 100 °C and then increased stepwise, 50 °C for each step until the temperature reached 600 °C - leaved for 15 minutes - cylindrical chamber are height from bottom of the furnace 11 cm.	Thin, flat, black color and very brittle Because cylindrical chamber not enough depth and heat for carbonized membrane.
- Furnace temperature was first increased from room temperature to 100 °C and then increased stepwise, 50 °C for each step until the temperature reached 600 °C - leaved for 12 minutes - cylindrical chamber are height from bottom of the furnace below 11 cm.	flat, black color and very brittle Because cylindrical chamber too deep and overheating for carbonized membrane.
- Furnace temperature was first increased from room temperature to 100 °C and then increased stepwise, 50 °C for each step until the temperature reached 600 °C - leaved for 12 minutes - cylindrical chamber are height from bottom of the furnace 11 cm.	Smoot, black color The membrane completely carbonized and not brittle.

Table G.2.1 Fluxes and permeability of pure methanol (100 wt %) as a feed for PV

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	1.572	1.673	1.543	1.07E-06	1.14E-06	1.05E-06
1.20	1.504	1.840	1.948	1.02E-06	1.25E-06	1.33E-06
1.40	1.603	1.786	1.959	1.09E-06	1.22E-06	1.33E-06
2.00	1.696	1.721	1.724	1.15E-06	1.17E-06	1.17E-06
2.20	1.651	1.608	1.868	1.12E-06	1.09E-06	1.27E-06
2.40	1.818	1.849	1.736	1.24E-06	1.26E-06	1.18E-06
3.00	1.504	1.812	1.696	1.02E-06	1.23E-06	1.15E-06
3.20	1.597	1.860	1.835	1.09E-06	1.27E-06	1.25E-06
3.40	1.572	1.786	1.639	1.07E-06	1.22E-06	1.12E-06
4.00	1.518	1.911	1.696	1.03E-06	1.30E-06	1.15E-06

Table G.2.2 Fluxes and permeability of pure methanol (100 wt %) as a feed for VP

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	1.128	1.196	-	7.67E-07	8.13E-07	-
1.20	1.422	1.442	-	9.66E-07	9.80E-07	-
1.40	1.244	1.439	-	8.45E-07	9.78E-07	-
2.00	1.320	1.326	-	8.97E-07	9.01E-07	-
2.20	1.365	1.314	-	9.28E-07	8.93E-07	-
2.40	1.419	1.453	-	9.65E-07	9.88E-07	-
3.00	1.142	1.467	-	7.76E-07	9.97E-07	-
3.20	1.244	1.495	-	8.45E-07	1.02E-06	-
3.40	1.300	1.360	-	8.84E-07	9.24E-07	-
4.00	1.266	1.320	-	8.61E-07	8.97E-07	-

Table G.3.1 Fluxes and permeability of pure ethanol (99.5 wt %) as a feed for PV

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.010	0.013	0.004	1.27E-08	1.62E-08	4.38E-09
1.20	0.010	0.013	0.010	1.27E-08	1.55E-08	1.20E-08
1.40	0.011	0.013	0.017	1.34E-08	1.55E-08	2.04E-08
2.00	0.017	0.018	0.032	2.11E-08	2.25E-08	3.91E-08
2.20	0.023	0.024	0.021	2.80E-08	2.94E-08	2.59E-08
2.40	0.019	0.032	0.034	2.38E-08	3.98E-08	4.19E-08
3.00	0.024	0.028	0.032	2.94E-08	3.50E-08	3.98E-08
3.20	0.026	0.030	0.035	3.15E-08	3.71E-08	4.26E-08
3.40	0.023	0.038	0.042	2.80E-08	4.68E-08	5.17E-08
4.00	0.024	0.036	0.024	2.94E-08	4.40E-08	2.94E-08
4.20	0.034	0.031	0.036	4.12E-08	3.78E-08	4.40E-08
4.40	0.024	0.034	0.031	3.01E-08	4.19E-08	3.85E-08
5.00	0.024	0.035	0.033	2.94E-08	4.33E-08	4.05E-08

Table G.3.2 Fluxes and permeability of pure ethanol (99.5 wt %) as a feed for VP

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.004	0.006	0.005	5.07E-09	7.16E-09	6.46E-09
1.20	0.005	0.006	0.003	5.77E-09	7.16E-09	3.68E-09
1.40	0.004	0.006	0.006	4.38E-09	7.16E-09	7.16E-09
2.00	0.006	0.005	0.006	7.16E-09	5.77E-09	7.16E-09
2.20	0.004	0.005	0.006	4.38E-09	6.46E-09	7.85E-09
2.40	0.005	0.007	0.006	5.77E-09	8.55E-09	7.16E-09
3.00	0.005	0.007	0.006	5.77E-09	8.55E-09	7.85E-09
3.20	0.006	0.007	0.006	7.16E-09	8.55E-09	7.85E-09
3.40	0.006	0.007	0.006	7.85E-09	8.55E-09	7.16E-09
4.00	0.006	0.006	0.006	7.85E-09	7.16E-09	7.85E-09

Table G.4.1 Fluxes and permeability of pure isopropanol (99.8 wt %) as a feed for PV

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.012	0.010	0.010	1.81E-08	1.47E-08	1.47E-08
1.20	0.012	0.010	0.009	1.75E-08	1.47E-08	1.34E-08
1.40	0.011	0.009	0.009	1.68E-08	1.34E-08	1.34E-08
2.00	0.010	0.009	0.009	1.47E-08	1.34E-08	1.34E-08
2.20	0.011	0.009	0.009	1.61E-08	1.34E-08	1.41E-08
2.40	0.009	0.008	0.009	1.34E-08	1.27E-08	1.34E-08
3.00	0.009	0.009	0.009	1.41E-08	1.34E-08	1.34E-08
3.20	0.009	0.009	0.009	1.34E-08	1.34E-08	1.41E-08
3.40	0.009	0.008	0.009	1.41E-08	1.27E-08	1.34E-08
4.00	0.009	0.009	0.009	1.41E-08	1.34E-08	1.34E-08

Table G.4.2 Fluxes and permeability of pure isopropanol (99.8 wt %) as a feed for VP

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.004	0.004	0.004	5.26E-09	5.26E-09	5.26E-09
1.20	0.004	0.004	0.004	5.26E-09	5.26E-09	5.26E-09
1.40	0.004	0.004	0.004	5.93E-09	5.26E-09	5.26E-09
2.00	0.004	0.004	0.004	5.93E-09	5.26E-09	6.61E-09
2.20	0.004	0.004	0.004	6.61E-09	5.93E-09	5.26E-09
2.40	0.004	0.004	0.004	5.93E-09	6.61E-09	5.26E-09
3.00	0.004	0.004	0.004	5.93E-09	5.93E-09	5.93E-09
3.20	0.004	0.004	0.004	5.93E-09	6.61E-09	5.26E-09
3.40	0.004	0.004	0.004	5.93E-09	5.93E-09	5.93E-09
4.00	0.004	0.004	0.004	5.93E-09	5.93E-09	5.93E-09

Table G.5.1 Fluxes and permeability of pure acetone (99.99 wt %) as a feed for PV

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.012	0.013	0.013	5.83E-09	6.31E-09	6.31E-09
1.20	0.013	0.012	0.013	6.31E-09	5.83E-09	6.31E-09
1.40	0.013	0.014	0.013	6.31E-09	6.79E-09	6.07E-09
2.00	0.039	0.015	0.035	1.83E-08	7.03E-09	1.67E-08
2.20	0.083	0.088	0.077	3.91E-08	4.15E-08	3.66E-08
2.40	0.063	0.105	0.071	2.97E-08	4.99E-08	3.38E-08
3.00	0.105	0.109	0.101	4.99E-08	5.16E-08	4.80E-08
3.20	0.115	0.127	0.141	5.42E-08	6.03E-08	6.65E-08
3.40	0.117	0.155	0.147	5.54E-08	7.35E-08	6.97E-08
4.00	0.114	0.129	0.135	5.40E-08	6.12E-08	6.41E-08
4.20	0.110	0.150	0.130	5.18E-08	7.09E-08	6.17E-08
4.40	0.111	0.154	0.137	5.23E-08	7.28E-08	6.48E-08
5.00	0.112	0.160	0.129	5.30E-08	7.59E-08	6.10E-08

Table G.5.2 Fluxes and permeability of pure acetone (99.99 wt %) as a feed for VP

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.067	0.066	0.091	3.19E-08	3.11E-08	4.29E-08
1.20	0.109	0.131	0.125	5.16E-08	6.20E-08	5.93E-08
1.40	0.140	0.141	0.147	6.61E-08	6.65E-08	6.94E-08
2.00	0.159	0.156	0.159	7.52E-08	7.40E-08	7.54E-08
2.20	0.169	0.165	0.144	7.98E-08	7.83E-08	6.82E-08
2.40	-	-	-			
3.00	0.186	0.170	0.192	8.82E-08	8.03E-08	9.11E-08
3.20	0.183	0.193	0.186	8.68E-08	9.13E-08	8.80E-08
3.40	0.191	0.181	0.187	9.06E-08	8.58E-08	8.85E-08
4.00	0.198	0.173	0.193	9.38E-08	8.20E-08	9.13E-08
4.20	0.187	0.185	0.194	8.87E-08	8.75E-08	9.21E-08
4.40	0.183	0.181	0.187	8.65E-08	8.58E-08	8.87E-08
5.00	0.189	0.184	0.190	8.94E-08	8.70E-08	8.99E-08

Table G.6.1 Fluxes and permeability of methanol/ethanol (20:80 wt %) mixture as a feed for PV

Fluxes and permeability of methanol

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.163	0.106	0.129	4.22E-07	2.76E-07	3.34E-07
1.20	0.137	0.114	0.123	3.55E-07	2.96E-07	3.20E-07
1.40	0.161	0.096	0.099	4.16E-07	2.49E-07	2.58E-07
2.00	0.145	0.104	0.128	3.75E-07	2.70E-07	3.31E-07
2.20	0.130	0.121	0.120	3.37E-07	3.14E-07	3.11E-07
2.40	0.149	0.103	0.132	3.87E-07	2.67E-07	3.43E-07
3.00	0.130	0.099	0.136	3.37E-07	2.58E-07	3.52E-07
3.20	0.136	0.095	0.135	3.52E-07	2.46E-07	3.49E-07
3.40	0.159	0.119	0.128	4.13E-07	3.08E-07	3.31E-07
4.00	0.131	0.104	0.131	3.40E-07	2.70E-07	3.40E-07
4.20	0.133	0.118	0.147	3.46E-07	3.05E-07	3.81E-07
4.40	0.154	0.109	0.111	3.99E-07	2.81E-07	2.87E-07
5.00	0.129	0.114	0.122	3.34E-07	2.96E-07	3.17E-07

Fluxes and permeability of ethanol

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.001	0.001	0.001	1.68E-09	1.68E-09	1.68E-09
1.20	0.001	0.001	0.001	1.68E-09	1.68E-09	1.68E-09
1.40	0.001	0.001	0.001	1.68E-09	1.68E-09	1.68E-09
2.00	0.004	0.006	0.012	5.88E-09	9.74E-09	2.01E-08
2.20	0.010	0.015	0.019	1.64E-08	2.59E-08	3.26E-08
2.40	0.023	0.017	0.019	3.82E-08	2.88E-08	3.26E-08
3.00	0.023	0.019	0.032	3.92E-08	3.26E-08	5.34E-08
3.20	0.030	0.020	0.032	4.96E-08	3.35E-08	5.44E-08
3.40	0.043	0.035	0.038	7.24E-08	5.82E-08	6.39E-08
4.00	0.034	0.028	0.041	5.72E-08	4.68E-08	6.86E-08
4.20	0.037	0.037	0.043	6.20E-08	6.20E-08	7.15E-08
4.40	0.048	0.027	0.039	8.00E-08	4.49E-08	6.58E-08
5.00	0.037	0.036	0.034	6.20E-08	6.01E-08	5.63E-08

Table G.6.2 Fluxes and permeability of methanol/ethanol (20:80 wt %) mixture as a feed for VP

Fluxes and permeability of methanol

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.254	0.197	0.189	6.23E-07	4.82E-07	4.63E-07
1.20	0.237	0.206	0.198	5.82E-07	5.04E-07	4.85E-07
1.40	0.260	0.207	0.210	6.37E-07	5.07E-07	5.15E-07
2.00	0.253	0.190	0.193	6.21E-07	4.65E-07	4.74E-07
2.20	0.222	0.187	0.180	5.43E-07	4.57E-07	4.40E-07
2.40	0.254	0.181	0.182	6.23E-07	4.43E-07	4.46E-07
3.00	0.251	0.173	0.174	6.15E-07	4.24E-07	4.27E-07
3.20	0.260	0.216	0.163	6.37E-07	5.29E-07	3.99E-07
3.40	0.228	0.170	0.142	5.60E-07	4.16E-07	3.49E-07
4.00	0.242	0.164	0.198	5.93E-07	4.02E-07	4.85E-07
4.20	0.250	0.194	0.179	6.12E-07	4.76E-07	4.38E-07
4.40	0.197	0.166	0.183	4.82E-07	4.07E-07	4.49E-07
5.00	0.188	0.149	0.180	4.60E-07	3.66E-07	4.40E-07

Fluxes and permeability of ethanol

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.001	0.001	0.001	2.32E-09	2.32E-09	2.32E-09
1.20	0.001	0.001	0.001	2.32E-09	2.32E-09	2.32E-09
1.40	0.001	0.001	0.001	2.32E-09	2.32E-09	2.32E-09
2.00	0.001	0.002	0.002	2.32E-09	3.33E-09	3.33E-09
2.20	0.002	0.001	0.002	3.33E-09	2.32E-09	3.33E-09
2.40	0.004	0.003	0.005	6.36E-09	5.35E-09	8.38E-09
3.00	0.007	0.008	0.009	1.24E-08	1.44E-08	1.55E-08
3.20	0.006	0.009	0.008	1.04E-08	1.55E-08	1.34E-08
3.40	0.015	0.017	0.018	2.76E-08	2.96E-08	3.26E-08
4.00	0.017	0.019	0.021	2.96E-08	3.36E-08	3.67E-08
4.20	0.023	0.021	0.024	4.07E-08	3.77E-08	4.27E-08
4.40	0.021	0.017	0.022	3.67E-08	2.96E-08	3.97E-08
5.00	0.019	0.017	0.023	3.36E-08	2.96E-08	4.17E-08

Table G.7.1 Fluxes and permeability of acetone/IPA (20:80 wt %) mixture as a feed for PV

Fluxes and permeability of acetone

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.012	0.012	0.012	1.62E-08	1.62E-08	1.62E-08
1.20	0.012	0.012	0.012	1.62E-08	1.62E-08	1.62E-08
1.40	0.012	0.012	0.012	1.62E-08	1.62E-08	1.62E-08
2.00	0.012	0.012	0.012	1.62E-08	1.62E-08	1.62E-08
2.20	0.012	0.012	0.012	1.62E-08	1.62E-08	1.62E-08
2.40	0.012	0.012	0.012	1.59E-08	1.59E-08	1.59E-08
3.00	0.012	0.012	0.012	1.62E-08	1.62E-08	1.62E-08
3.20	0.012	0.012	0.012	1.62E-08	1.62E-08	1.62E-08
3.40	0.012	0.012	0.012	1.62E-08	1.62E-08	1.62E-08
4.00	0.012	0.012	0.012	1.62E-08	1.62E-08	1.62E-08
4.20	0.012	0.012	0.012	1.62E-08	1.62E-08	1.62E-08
4.40	0.012	0.012	0.012	1.62E-08	1.62E-08	1.62E-08
5.00	0.012	0.012	0.012	1.62E-08	1.62E-08	1.62E-08

Table G.7.2 Fluxes and permeability of acetone/IPA (20:80 wt %) mixture as a feed for VP

Fluxes and permeability of acetone

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.012	0.012	0.012	3.32E-08	3.32E-08	3.32E-08
1.20	0.012	0.012	0.012	3.32E-08	3.32E-08	3.32E-08
1.40	0.012	0.012	0.012	3.32E-08	3.32E-08	3.32E-08
2.00	0.012	0.012	0.012	3.27E-08	3.27E-08	3.27E-08
2.20	0.012	0.012	0.012	3.32E-08	3.32E-08	3.32E-08
2.40	0.012	0.012	0.012	3.27E-08	3.27E-08	3.27E-08
3.00	0.012	0.012	0.012	3.32E-08	3.32E-08	3.32E-08
3.20	0.012	0.012	0.012	3.32E-08	3.32E-08	3.32E-08
3.40	0.012	0.012	0.012	3.32E-08	3.32E-08	3.32E-08
4.00	0.012	0.012	0.012	3.32E-08	3.32E-08	3.32E-08
4.20	0.012	0.012	0.012	3.32E-08	3.32E-08	3.32E-08
4.40	0.012	0.012	0.012	3.32E-08	3.32E-08	3.32E-08
5.00	0.012	0.012	0.012	3.32E-08	3.32E-08	3.32E-08

Table G.8.1 Fluxes and permeability of methanol/acetone (20:80 wt %) mixture as a feed for PV

Fluxes and permeability of methanol

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.150	0.207	0.184	2.43E-07	3.34E-07	2.97E-07
1.20	0.158	0.217	0.193	2.55E-07	3.50E-07	3.12E-07
1.40	0.155	0.204	0.200	2.50E-07	3.28E-07	3.23E-07
2.00	0.149	0.164	0.183	2.41E-07	2.64E-07	2.95E-07
2.20	0.161	0.201	0.206	2.59E-07	3.25E-07	3.32E-07
2.40	0.157	0.165	0.202	2.54E-07	2.66E-07	3.26E-07
3.00	0.162	0.205	0.207	2.61E-07	3.30E-07	3.34E-07
3.20	0.164	0.175	0.220	2.64E-07	2.83E-07	3.56E-07
3.40	0.180	0.226	0.236	2.90E-07	3.65E-07	3.81E-07
4.00	0.196	0.237	0.207	3.16E-07	3.83E-07	3.34E-07
4.20	0.201	0.245	0.190	3.25E-07	3.96E-07	3.06E-07
4.40	0.192	0.243	0.208	3.10E-07	3.92E-07	3.36E-07
5.00	0.219	0.232	0.225	3.54E-07	3.74E-07	3.63E-07
5.20	0.226	0.219	0.242	3.65E-07	3.54E-07	3.90E-07
5.40	0.193	0.268	0.216	3.12E-07	4.32E-07	3.48E-07
6.00	0.178	0.216	0.234	2.86E-07	3.48E-07	3.78E-07
6.20	0.220	0.234	0.254	3.56E-07	3.78E-07	4.10E-07
6.40	0.201	0.207	0.258	3.25E-07	3.34E-07	4.16E-07
7.00	0.219	0.223	0.231	3.54E-07	3.59E-07	3.72E-07

Fluxes and permeability of acetone

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.012	0.013	0.012	7.99E-09	8.32E-09	7.99E-09
1.20	0.012	0.013	0.012	7.99E-09	8.32E-09	7.99E-09
1.40	0.012	0.013	0.012	7.99E-09	8.32E-09	7.99E-09
2.00	0.012	0.013	0.013	7.99E-09	8.32E-09	8.32E-09
2.20	0.013	0.013	0.013	8.32E-09	8.65E-09	8.32E-09
2.40	0.013	0.015	0.013	8.32E-09	9.97E-09	8.32E-09
3.00	0.013	0.020	0.014	8.32E-09	1.29E-08	9.31E-09
3.20	0.017	0.024	0.021	1.13E-08	1.56E-08	1.36E-08
3.40	0.031	0.034	0.028	1.99E-08	2.22E-08	1.79E-08
4.00	0.042	0.041	0.049	2.75E-08	2.65E-08	3.21E-08
4.20	0.048	0.046	0.045	3.14E-08	2.98E-08	2.91E-08
4.40	0.049	0.047	0.041	3.21E-08	3.04E-08	2.68E-08
5.00	0.060	0.046	0.051	3.87E-08	2.98E-08	3.31E-08
5.20	0.064	0.042	0.068	4.17E-08	2.75E-08	4.40E-08
5.40	0.055	0.055	0.064	3.54E-08	3.57E-08	4.17E-08
6.00	0.048	0.043	0.056	3.14E-08	2.78E-08	3.60E-08
6.20	0.064	0.048	0.049	4.13E-08	3.14E-08	3.18E-08
6.40	0.057	0.044	0.058	3.67E-08	2.85E-08	3.74E-08
7.00	0.062	0.045	0.055	4.03E-08	2.91E-08	3.57E-08

Table G.8.2 Show fluxes and permeability of methanol/acetone (20:80 wt %) mixture as a feed for VP

Fluxes and permeability of methanol

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.204	0.225	0.199	2.88E-07	3.18E-07	2.82E-07
1.20	0.196	0.179	0.206	2.77E-07	2.53E-07	2.91E-07
1.40	0.202	0.184	0.191	2.86E-07	2.61E-07	2.70E-07
2.00	0.187	0.279	0.197	2.64E-07	3.95E-07	2.78E-07
2.20	0.200	0.209	0.191	2.83E-07	2.96E-07	2.70E-07
2.40	0.193	0.157	0.209	2.74E-07	2.22E-07	2.96E-07
3.00	0.200	0.196	0.211	2.83E-07	2.77E-07	2.99E-07
3.20	0.211	0.193	0.214	2.99E-07	2.74E-07	3.02E-07
3.40	0.222	0.252	0.233	3.14E-07	3.57E-07	3.30E-07
4.00	0.258	0.275	0.245	3.65E-07	3.89E-07	3.47E-07
4.20	0.236	0.262	0.254	3.34E-07	3.71E-07	3.60E-07
4.40	0.250	0.315	0.274	3.54E-07	4.46E-07	3.87E-07
5.00	0.271	0.293	0.301	3.84E-07	4.14E-07	4.26E-07
5.20	0.244	0.268	0.256	3.46E-07	3.79E-07	3.62E-07
5.40	0.270	0.311	0.298	3.82E-07	4.40E-07	4.22E-07
6.00	0.241	0.302	0.286	3.41E-07	4.27E-07	4.05E-07
6.20	0.254	0.323	0.288	3.60E-07	4.58E-07	4.08E-07
6.40	0.265	0.236	0.278	3.74E-07	3.34E-07	3.94E-07
7.00	0.262	0.310	0.296	3.71E-07	4.38E-07	4.19E-07

Fluxes and permeability of acetone

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.019	0.024	0.019	1.49E-08	1.80E-08	1.45E-08
1.20	0.021	0.031	0.018	1.64E-08	2.38E-08	1.37E-08
1.40	0.023	0.028	0.028	1.72E-08	2.15E-08	2.11E-08
2.00	0.029	0.027	0.030	2.19E-08	2.07E-08	2.26E-08
2.20	0.024	0.030	0.033	1.80E-08	2.26E-08	2.50E-08
2.40	0.020	0.028	0.031	1.56E-08	2.11E-08	2.38E-08
3.00	0.025	0.035	0.032	1.88E-08	2.65E-08	2.46E-08
3.20	0.030	0.028	0.032	2.30E-08	2.15E-08	2.42E-08
3.40	0.045	0.038	0.034	3.47E-08	2.93E-08	2.62E-08
4.00	0.062	0.049	0.028	4.72E-08	3.78E-08	2.15E-08
4.20	0.063	0.056	0.068	4.83E-08	4.25E-08	5.22E-08
4.40	0.070	0.074	0.077	5.38E-08	5.69E-08	5.88E-08
5.00	0.109	0.075	0.085	8.33E-08	5.73E-08	6.51E-08
5.20	0.073	0.067	0.083	5.61E-08	5.14E-08	6.31E-08
5.40	0.083	0.093	0.035	6.35E-08	7.09E-08	2.69E-08
6.00	0.081	0.095	0.079	6.16E-08	7.24E-08	6.04E-08
6.20	0.083	0.092	0.087	6.31E-08	7.05E-08	6.62E-08
6.40	0.084	0.067	0.073	6.39E-08	5.10E-08	5.57E-08
7.00	0.090	0.096	0.081	6.89E-08	7.36E-08	6.16E-08

Table G.9.1 Fluxes and permeability of acetone/ethanol (50:50 wt %) mixture as a feed for PV

Fluxes and permeability of acetone

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.001	0.001	0.000	6.46E-10	6.46E-10	1.49E-10
1.20	0.002	0.000	0.005	2.14E-09	1.49E-10	4.12E-09
1.40	0.002	0.000	0.004	2.14E-09	1.49E-10	3.63E-09
2.00	0.002	0.000	0.001	1.64E-09	-3.48E-10	6.46E-10
2.20	0.002	0.000	0.000	2.14E-09	-3.48E-10	1.49E-10
2.40	0.002	0.000	0.000	1.64E-09	-3.48E-10	1.49E-10
3.00	0.003	0.000	0.001	2.63E-09	-3.48E-10	6.46E-10
3.20	0.000	0.000	0.000	1.49E-10	1.49E-10	1.49E-10
3.40	0.000	0.000	0.000	1.49E-10	1.49E-10	1.49E-10
4.00	0.000	0.000	0.000	1.49E-10	1.49E-10	1.49E-10
4.20	0.001	0.000	0.002	6.46E-10	1.49E-10	1.64E-09
4.40	0.003	0.000	0.007	2.63E-09	1.49E-10	6.11E-09
5.00	0.008	0.002	0.010	6.61E-09	2.14E-09	9.09E-09
5.20	0.009	0.006	0.013	7.60E-09	5.61E-09	1.16E-08
5.40	0.018	0.011	0.022	1.60E-08	9.59E-09	1.95E-08
6.00	0.019	0.011	0.022	1.65E-08	1.01E-08	1.95E-08
6.20	0.017	0.012	0.020	1.46E-08	1.06E-08	1.75E-08
6.40	0.018	0.015	0.022	1.60E-08	1.31E-08	1.95E-08
7.00	0.014	0.019	0.026	1.26E-08	1.65E-08	2.25E-08
7.20	0.019	0.021	0.027	1.65E-08	1.80E-08	2.40E-08
7.40	0.024	0.022	0.022	2.10E-08	1.90E-08	1.90E-08
8.00	0.020	0.017	0.026	1.75E-08	1.50E-08	2.25E-08

Fluxes and permeability of ethanol

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.006	0.007	0.006	1.21E-08	1.43E-08	1.21E-08
1.20	0.010	0.007	0.010	1.87E-08	1.43E-08	1.87E-08
1.40	0.010	0.007	0.007	1.87E-08	1.43E-08	1.43E-08
2.00	0.008	0.007	0.005	1.65E-08	1.43E-08	9.88E-09
2.20	0.010	0.012	0.005	1.87E-08	2.31E-08	9.88E-09
2.40	0.008	0.024	0.005	1.65E-08	4.72E-08	9.88E-09
3.00	0.011	0.044	0.005	2.09E-08	8.46E-08	9.88E-09
3.20	0.020	0.053	0.005	3.84E-08	1.02E-07	9.88E-09
3.40	0.025	0.057	0.005	4.94E-08	1.11E-07	9.88E-09
4.00	0.049	0.058	0.016	9.55E-08	1.13E-07	3.18E-08
4.20	0.050	0.060	0.031	9.77E-08	1.17E-07	6.04E-08
4.40	0.054	0.068	0.036	1.04E-07	1.33E-07	6.92E-08
5.00	0.059	0.076	0.046	1.15E-07	1.48E-07	8.89E-08
5.20	0.049	0.081	0.053	9.55E-08	1.57E-07	1.02E-07
5.40	0.073	0.088	0.054	1.42E-07	1.70E-07	1.04E-07
6.00	0.066	0.096	0.049	1.28E-07	1.86E-07	9.55E-08
6.20	0.063	0.083	0.068	1.22E-07	1.61E-07	1.33E-07
6.40	0.063	0.075	0.064	1.22E-07	1.46E-07	1.24E-07
7.00	0.049	0.085	0.053	9.55E-08	1.66E-07	1.02E-07
7.20	0.063	0.093	0.060	1.22E-07	1.81E-07	1.17E-07
7.40	0.076	0.092	0.079	1.48E-07	1.79E-07	1.53E-07
8.00	0.067	0.094	0.071	1.31E-07	1.83E-07	1.37E-07

Table G.9.2 Fluxes and permeability of acetone/ethanol (50:50 wt %) mixture as a feed for VP

Fluxes and permeability of acetone

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.005	0.001	0.000	5.35E-09	7.48E-10	1.73E-10
1.20	0.004	0.001	0.000	4.20E-09	1.32E-09	1.73E-10
1.40	0.002	0.001	0.000	2.47E-09	1.32E-09	1.73E-10
2.00	0.003	0.001	0.000	3.05E-09	1.32E-09	1.73E-10
2.20	0.002	0.001	0.000	2.47E-09	7.48E-10	1.73E-10
2.40	0.002	0.001	0.000	1.90E-09	7.48E-10	1.73E-10
3.00	0.001	0.001	0.000	1.32E-09	7.48E-10	1.73E-10
3.20	0.001	0.001	0.000	1.32E-09	7.48E-10	1.73E-10
3.40	0.001	0.001	0.000	1.32E-09	7.48E-10	1.73E-10
4.00	0.001	0.001	0.000	1.32E-09	7.48E-10	1.73E-10
4.20	0.001	0.001	0.000	1.32E-09	7.48E-10	1.73E-10
4.40	0.001	0.001	0.000	1.32E-09	7.48E-10	1.73E-10
5.00	0.002	0.001	0.000	2.47E-09	7.48E-10	1.73E-10
5.20	0.001	0.002	0.000	1.32E-09	1.90E-09	1.73E-10
5.40	0.001	0.001	0.000	1.32E-09	7.48E-10	1.73E-10
6.00	0.001	0.001	0.001	1.32E-09	7.48E-10	7.48E-10
6.20	0.001	0.000	0.001	1.32E-09	1.73E-10	7.48E-10
6.40	0.001	0.000	0.000	1.32E-09	1.73E-10	1.73E-10
7.00	0.001	0.001	0.000	1.32E-09	7.48E-10	1.73E-10
7.20	0.001	0.001	0.001	1.32E-09	7.48E-10	7.48E-10
7.40	0.002	0.000	0.001	1.90E-09	1.73E-10	7.48E-10
8.00	0.001	0.000	0.000	7.48E-10	1.73E-10	1.73E-10

Fluxes and permeability of ethanol

Time (h)	Flux (mol/m^2.h)			Permeability (mol.m/m^2.h.kPa)		
	1	2	3	1	2	3
1.00	0.011	0.005	0.006	2.05E-08	9.71E-09	1.19E-08
1.20	0.008	0.005	0.006	1.62E-08	9.71E-09	1.19E-08
1.40	0.007	0.005	0.006	1.40E-08	9.71E-09	1.19E-08
2.00	0.007	0.005	0.006	1.40E-08	9.71E-09	1.19E-08
2.20	0.007	0.005	0.006	1.40E-08	9.71E-09	1.19E-08
2.40	0.007	0.005	0.006	1.40E-08	9.71E-09	1.19E-08
3.00	0.006	0.005	0.006	1.19E-08	9.71E-09	1.19E-08
3.20	0.006	0.005	0.006	1.19E-08	9.71E-09	1.19E-08
3.40	0.006	0.005	0.006	1.19E-08	9.71E-09	1.19E-08
4.00	0.006	0.005	0.006	1.19E-08	9.71E-09	1.19E-08
4.20	0.006	0.005	0.006	1.19E-08	9.71E-09	1.19E-08
4.40	0.006	0.005	0.006	1.19E-08	9.71E-09	1.19E-08
5.00	0.006	0.005	0.006	1.19E-08	9.71E-09	1.19E-08
5.20	0.006	0.005	0.006	1.19E-08	9.71E-09	1.19E-08
5.40	0.006	0.005	0.006	1.19E-08	9.71E-09	1.19E-08
6.00	0.006	0.005	0.005	1.19E-08	9.71E-09	9.71E-09
6.20	0.005	0.005	0.006	9.71E-09	9.71E-09	1.19E-08
6.40	0.007	0.006	0.006	1.40E-08	1.19E-08	1.19E-08
7.00	0.007	0.005	0.006	1.40E-08	9.71E-09	1.19E-08
7.20	0.007	0.005	0.006	1.40E-08	9.71E-09	1.19E-08
7.40	0.007	0.006	0.006	1.40E-08	1.19E-08	1.19E-08
8.00	0.007	0.005	0.006	1.40E-08	9.71E-09	1.19E-08