Electronic Supplementary Information (ESI)

Development of Pervaporation Membranes Using Chitosan and Titanium glycine-N,N-dimethylphosphonate for Dehydration of Isopropanol

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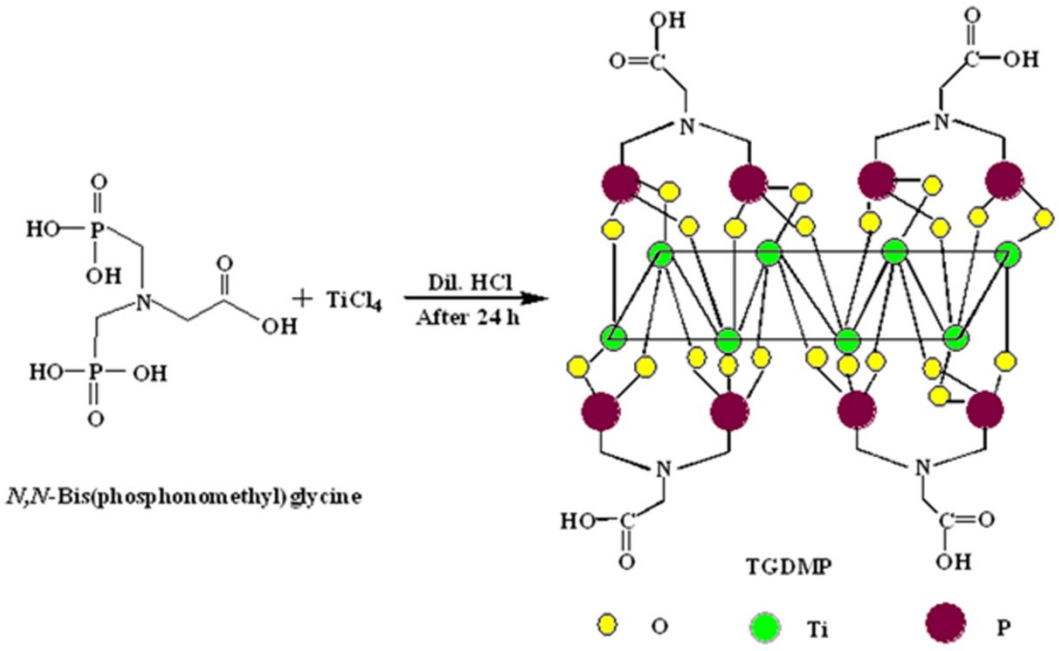

Figure S1. Scheme for the synthesis of titanium glycine-*N, N*-dimethylphosphonate (TGDMP).

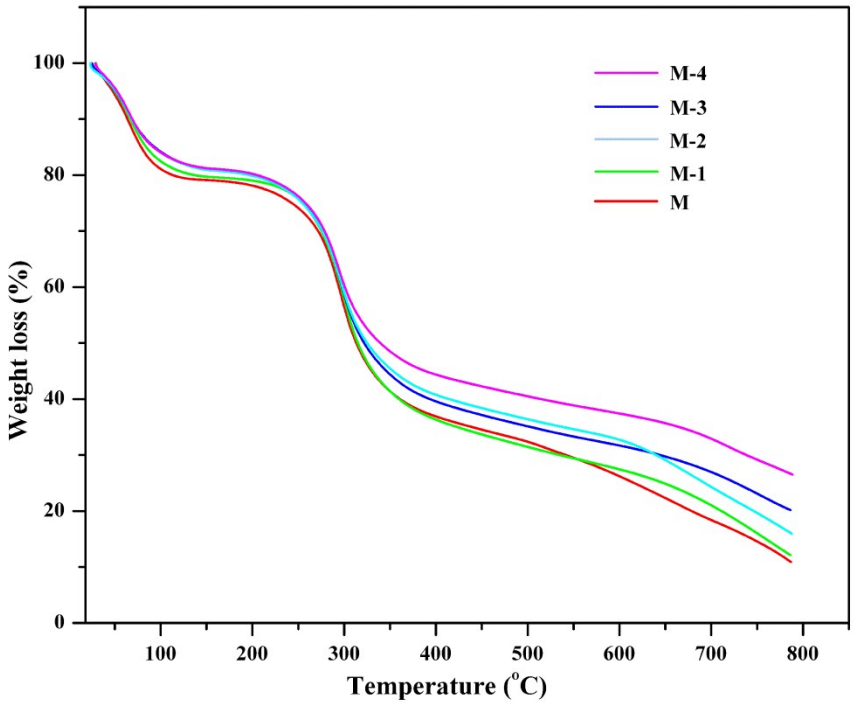

Figure S2. Thermogravimetric analysis of chitosan and its nanocomposite membranes: (M) 0 mass%; (M-1) 0.4 mass%; (M-2) 0.8 mass%; (M-3) 1.2 mass%; (M-4) 1.6 mass% of TGDMP.

Table S3. Diffusion coefficients of water and isopropanol for all membranes at different mass% of water in the feed.

Mass % of water	D_w x 10^8 (cm^2/s)					D_{IPA} x10^{10} (cm^2/s)				
	M	M-1	M-2	M-3	M-4	M	M-1	M-2	M-3	M-4
5	4.41	5.11	10.20	10.82	11.51	2.67	2.62	2.55	1.50	3.41
10	5.65	8.69	10.53	11.31	12.91	6.10	5.33	4.64	3.66	11.42
15	6.14	8.98	11.02	11.91	13.82	11.12	10.31	10.10	9.08	22.31
20	7.09	9.32	11.32	12.10	15.80	39.01	35.00	29.81	28.60	50.71
25	7.90	9.85	13.01	15.00	17.71	58.61	54.41	49.91	40.82	68.80

Table S4. Pervaporation flux and separation selectivity of all different membranes at different temperatures for 10 mass% of water in the feed.

Temp. °C	J x10^2 (kg/m^2h)					α_{sep}				
	M	M-1	M-2	M-3	M-4	M	M-1	M-2	M-3	M-4
30	3.20	4.93	6.41	7.37	10.22	554	607	694	1050	591
40	4.28	5.00	6.56	7.82	10.97	329	374	453	554	453
50	5.04	5.72	6.83	7.93	11.37	293	299	374	410	329

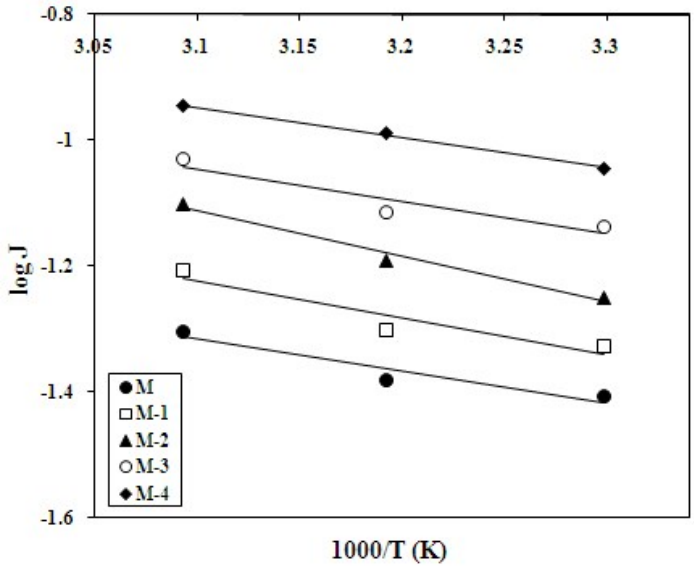

Figure S5. Variation of log *J* with temperature for chitosan and its nanocomposite membranes at 10 mass% of water in the feed.

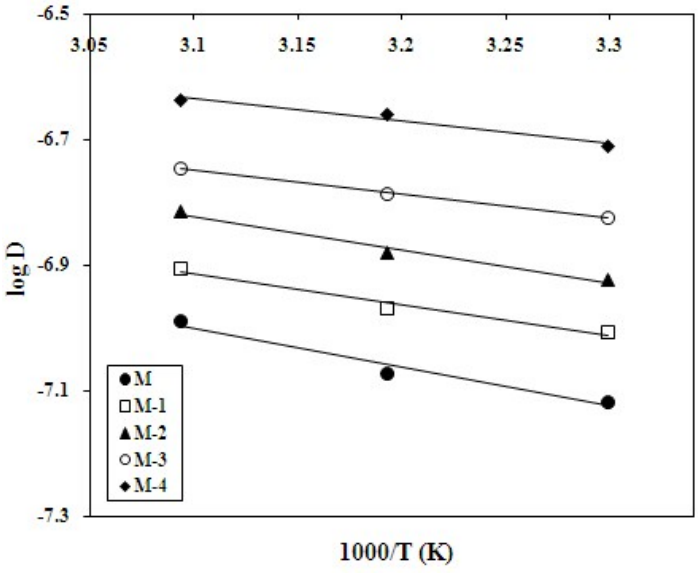

Figure S6. Variation of log *D* with temperature for chitosan and its nanocomposite membranes at 10 mass% of water in the feed.