

## Supplementary material

# Tuning the Wettability and Surface Free Energy of Poly(vinyl phenol) Thin Films by Modulating Hydrogen-Bonding Interactions

Chih-Feng Wang<sup>1\*</sup>, Dula Daksa Ejeta<sup>1</sup>, Jian-Yi Wu<sup>2</sup>, Shiao-Wei  
Kuo<sup>3, 4\*</sup>, Ching-Hsuan Lin<sup>5</sup>, Juin-Yih Lai<sup>1, 6</sup>

<sup>1</sup>Advanced Membrane Materials Research Center, Graduate Institute of Applied Science and Technology, National Taiwan University of Science and Technology, Taipei, 106, Taiwan

<sup>2</sup>Department of Materials Science and Engineering, I-Shou University, Kaohsiung, 840, Taiwan.

<sup>3</sup>Department of Materials and Optoelectronic Science, National Sun Yat-Sen University, Kaohsiung, 804, Taiwan.

<sup>4</sup>Department of Medicinal and Applied Chemistry, Kaohsiung Medical University, Kaohsiung, 807, Taiwan

<sup>5</sup>Department of Chemical Engineering, National Chung Hsing University, Taichung 402, Taiwan

<sup>6</sup>R&D Centre for Membrane Technology, Chung Yuan University, Taoyuan, 320, Taiwan

\*To whom all correspondence should be addressed

E-mail: [cfwang@mail.ntust.edu.tw](mailto:cfwang@mail.ntust.edu.tw)

[kuosw@faculty.nsysu.edu.tw](mailto:kuosw@faculty.nsysu.edu.tw)

Tel: 886-2-27301210 (C.-F.W.) 886-525-2000 (S.-W.K.)

Fax: 886-2-27303733(C.-F.W.) 886-525-4099 (S.-W.K.)

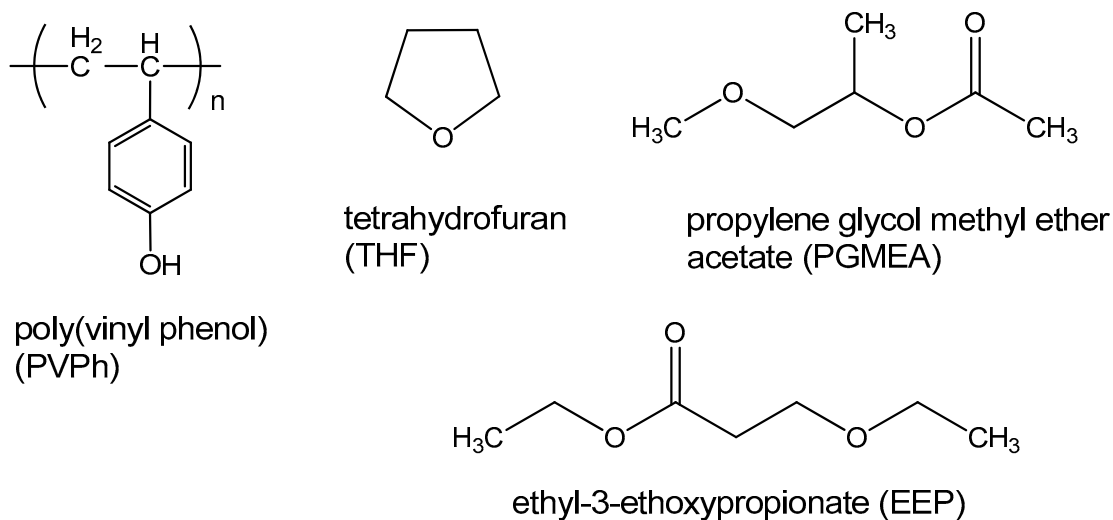


Figure S1. The chemical structures of PVPh, THF, PGMEA, and EEP.

Table S1. FTIR spectrum fitting results of PVPh-T films.

Thermal treatment time (h)		Peak 1 3234–3110 cm <sup>-1</sup>	Peak 2 3450–3350 cm <sup>-1</sup>	Peak 3 3550–3515 cm <sup>-1</sup>	Peak 4 3650–3580 cm <sup>-1</sup>
0	Position (cm <sup>-1</sup> )	3232	3409	3526	3612
	FWHM (cm <sup>-1</sup> )	264	227	120	82
	Fraction (%)	50.3	38.8	7.3	3.6
1	Position (cm <sup>-1</sup> )	3222	3402	3524	3617
	FWHM (cm <sup>-1</sup> )	269	233	120	85
	Fraction (%)	48.6	38.9	8.3	4.2
4	Position (cm <sup>-1</sup> )	3226	3406	3523	3614
	FWHM (cm <sup>-1</sup> )	263	229	114	84
	Fraction (%)	44.5	43.8	7.2	4.5
8	Position (cm <sup>-1</sup> )	3218	3410	3527	3614
	FWHM (cm <sup>-1</sup> )	271	231	111	83
	Fraction (%)	43.1	44.1	7.3	5.5

Table S2. FTIR spectrum fitting results of PVPh-P films.

Thermal treatment time (h)		Peak 1 3234–3110 cm <sup>-1</sup>	Peak 2 3450–3350 cm <sup>-1</sup>	Peak 3 3550–3515 cm <sup>-1</sup>	Peak 4 3650–3580 cm <sup>-1</sup>
0	Position (cm <sup>-1</sup> )	3231	3402	3525	3613
	FWHM (cm <sup>-1</sup> )	287	213	120	79
	Fraction (%)	50.7	36.3	9.2	3.8
1	Position (cm <sup>-1</sup> )	3230	3400	3517	3614
	FWHM (cm <sup>-1</sup> )	294	218	114	89
	Fraction (%)	51.9	35.0	7.4	5.7
4	Position (cm <sup>-1</sup> )	3232	3409	3524	3614
	FWHM (cm <sup>-1</sup> )	291	218	102	89
	Fraction (%)	52.1	34.8	7.2	5.9
8	Position (cm <sup>-1</sup> )	3233	3410	3529	3615
	FWHM (cm <sup>-1</sup> )	294	184	119	76
	Fraction (%)	52.8	29.3	11.5	6.4

Table S3. FTIR spectrum fitting results of PVPh-E films.

Thermal treatment time (h)		Peak 1 3234–3110 cm <sup>-1</sup>	Peak 2 3450–3350 cm <sup>-1</sup>	Peak 3 3550–3515 cm <sup>-1</sup>	Peak 4 3650–3580 cm <sup>-1</sup>
0	Position (cm <sup>-1</sup> )	3232	3407	3522	3614
	FWHM (cm <sup>-1</sup> )	286	219	107	91
	Fraction (%)	51.1	37.7	7.2	4.0
1	Position (cm <sup>-1</sup> )	3222	3396	3519	3612
	FWHM (cm <sup>-1</sup> )	292	217	113	86
	Fraction (%)	52.0	32.8	8.8	6.4
4	Position (cm <sup>-1</sup> )	3233	3415	3536	3621
	FWHM (cm <sup>-1</sup> )	294	212	98	89
	Fraction (%)	52.6	32.7	8.1	6.6
8	Position (cm <sup>-1</sup> )	3232	3417	3527	3617
	FWHM (cm <sup>-1</sup> )	304	199	113	104
	Fraction (%)	53.0	28.6	9.3	9.1