Supporting Information

110th Anniversary: High Molecular Weight Chitin and Cellulose Hydrogels from Biomass in Ionic Liquids without Chemical Crosslinking

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Viscosity. Determinations were conducted with a ViscoLab 4000 Small Sample Viscometer (PAC Cambridge, Houston, TX), which utilizes oscillating piston technology and an embedded PT100 temperature sensor, equipped with pistons 10-200 cP, 25-500 cP, 50-1,000 cP, and 100-2,000 cP.

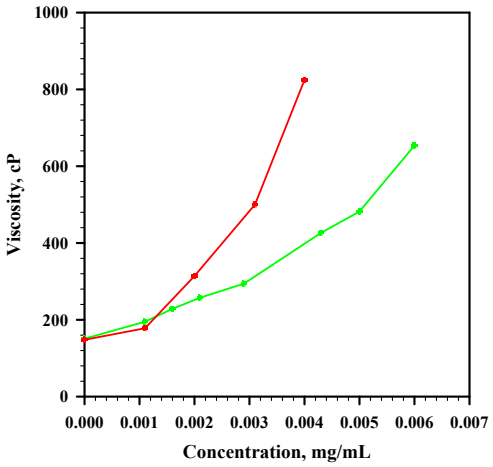
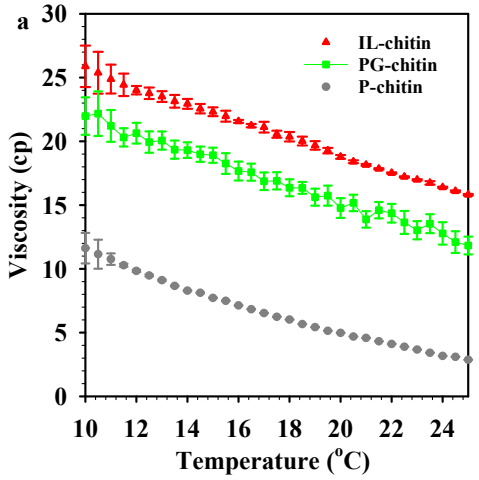


Figure S1. Viscosity of IL-chitin (red) and PG-chitin (green) in [C_2mim][OAc], from different concentrations at 25 °C.



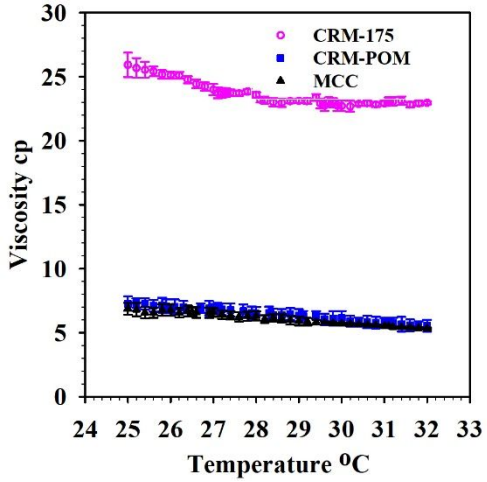


Figure S2. Viscosity of 1 wt% solution in NaOH-urea of: IL-chitin (red), PG-chitin (green), and P-chitin (grey) at different temperatures.

Figure S3. Viscosity of 1 wt% solution in NaOH-urea of: CRM-175 (pink), CRM-POM (blue) and MCC (black), at different temperatures.

Conductivity. Measurements were conducted using Conductivity meter Acumet benchtop model (Cole-Parmer, Vernon Hills, IL) equipped with Fisherbrand AccumetT temperature-compensated two-cell conductivity probe. Prior to use, the conductivity cell was soaked in DI water for 10 min, the conductivity cell connected to the conductivity meter, and measurements taken.

Table S1. Conductivity of IL aqueous solutions.

Water Mass, g	IL Mass, g	IL Concentration, wt%	Conductivity, µS
10.01010	0.00380	0.03795	138.1
10.01606	0.00617	0.06156	229.9
9.99379	0.01103	0.11025	505.2
9.99919	0.01402	0.14002	508.2
9.99974	0.01946	0.19423	692.7
10.00611	0.02161	0.21550	915.5

10.00507	0.02757	0.27480	929.4
10.00690	0.03164	0.31519	1102.0
10.00456	0.02930	0.29201	1111.0
10.00597	0.03499	0.34847	1200.0
10.01722	0.04169	0.41446	1405.0
10.00076	0.04777	0.47539	1599.0
9.99937	0.05178	0.51516	1717.0
10.02906	0.05372	0.53279	1767.0
10.00174	0.05853	0.58179	1929.0
10.00633	0.06239	0.61964	1954.0
10.01202	0.06527	0.64769	2175.0
10.00535	0.07086	0.70324	2333.0
10.00031	0.07556	0.74991	2453.0
10.01645	0.07895	0.78204	2566.0
10.00661	0.08464	0.83875	2762.0
10.00389	0.08886	0.88043	2858.0
10.00245	0.09249	0.91620	2929.0
10.00906	0.09388	0.92923	3023.0
10.00460	0.09940	0.98377	3190.0

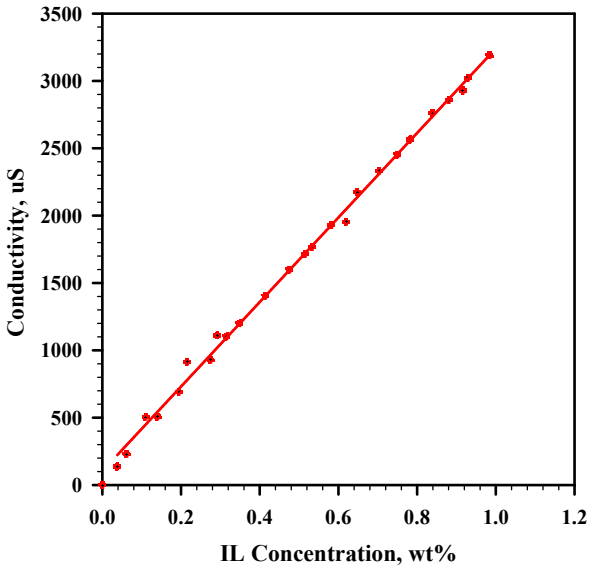


Figure S4. Calibration curve for conductivity of IL aqueous solutions.

Fourier-Transform Infra-Red Spectroscopy (FT-IR). FT-IR spectra of the cellulosic and chitinous aerogels were recorded in the range of 500–4000 cm^{-1} using a Bruker Alpha FT-IR instrument (Bruker Optics Inc., Billerica, MA, USA) with an attenuated total reflectance (ATR) sampler.

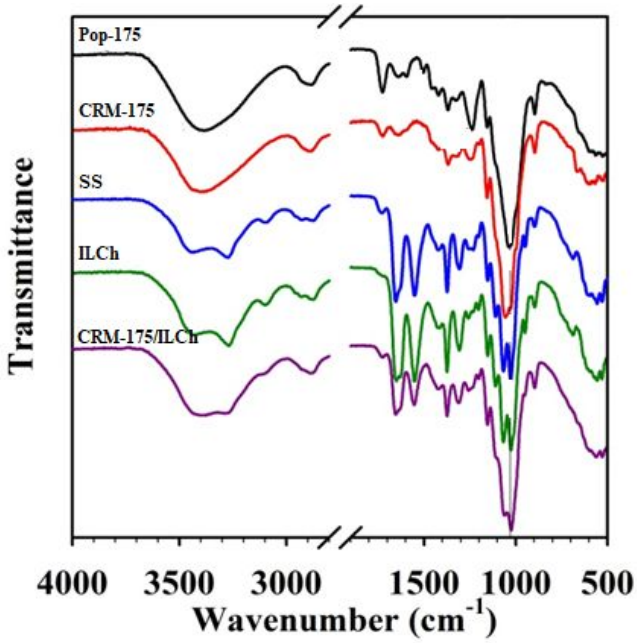


Figure S5. FT-IR spectra of cellulosic and chitinous 3D aerogels.

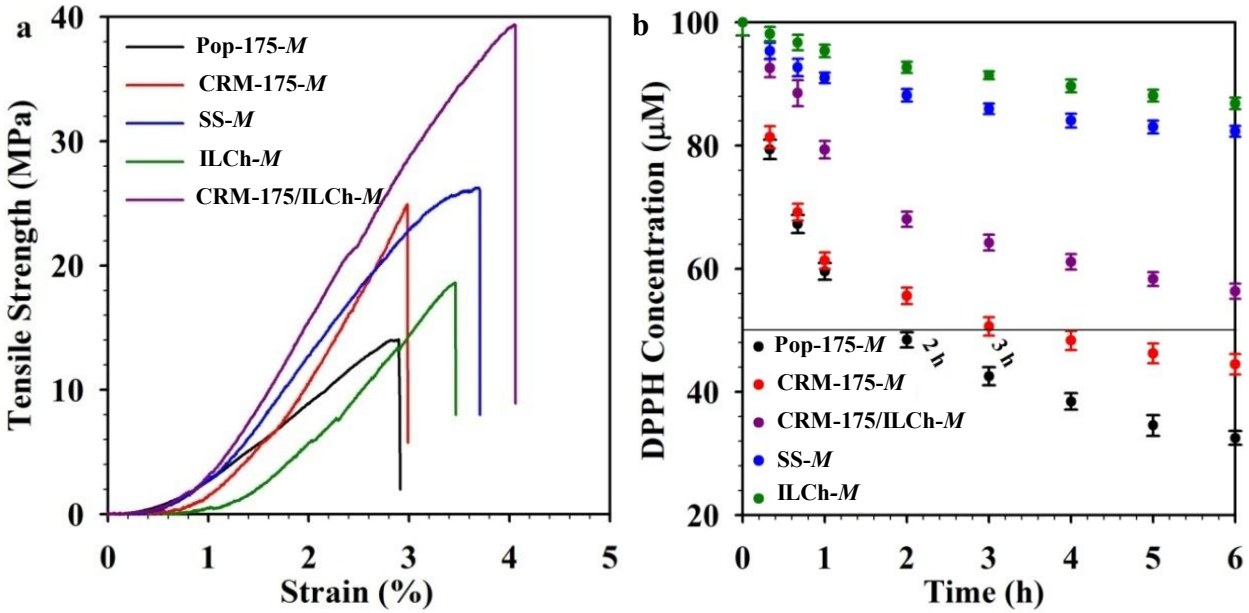


Figure S6. (a) Tensile properties and (b) antioxidant efficiency of the air-dried composite membrane compared with the other membranes tested in this study.

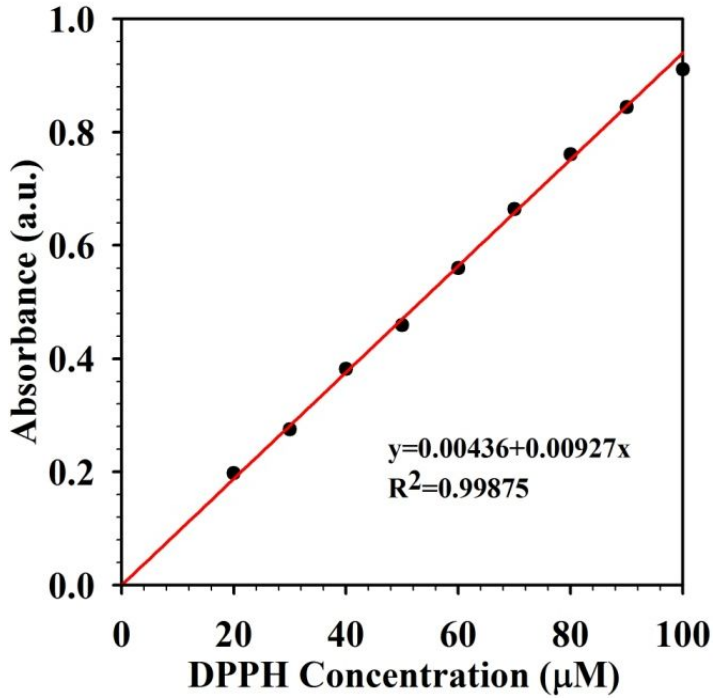


Figure S7. Calibration curve of DPPH/methanol solutions at 23 °C.

Table S2. Volumes and Masses of Cellulosic and Chitinous Gels (Original, Alco-, and Aerogels).

Property	*Gel type*	*Cellulosic gels*					*Chitinous gels*			*Composite*
		Pop-175	*Pop-POM*	*CRM-175*	*CRM-POM*	*MCC*	*SS*	*ILCh*	*PGCh*	*CRM 175/ ILCh*
Dimensions (D, mm; h, mm)[a]	*Original*	11.0; 10.0	10.5; 10.0	9.0; 8.0	11.5; 8.0	12.0; 9.0	12.0; 9.0	11.0; 9.0	12.0; 7.5	10.5; 8.0
	Alcogel	10.0; 6.0	10.0; 6.0	8.5; 8.0	11.0; 7.5	12.0; 9.0	12.0; 8.5	11.0; 9.0	12.0; 7.5	10.5; 8.0
	Aerogel	7.5; 5.0	7.0; 5.5	7.0; 7.0	9.0; 6.5	11.0; 9.0	10.5; 7.5	10.0; 9.0	11.0; 7.5	10.0; 7.0
	Rehydrated	7.0; 5.0	7.0; 5.0	6.5; 5.0	9.0; 6.5	9.0; 7.0	6.5; 6.5	8.0; 7.0	10.0; 6.0	7.0; 5.0
Volume (cm^3)	*Original*	0.95	0.87	0.51	0.83	1.02	1.02	0.86	0.85	0.69
	Alcogel	0.47	0.47	0.45	0.71	1.02	0.96	0.86	0.85	0.69
	Aerogel	0.22	0.21	0.27	0.41	0.86	0.65	0.71	0.71	0.55
	Rehydrated	0.19	0.19	0.17	0.41	0.45	0.22	0.35	0.47	0.19
Mass (g)	*Original*	0.84(4)	0.81(2)	0.62(1)	0.81(2)	1.14(3)	1.01(4)	1.01(3)	0.80(2)	0.96(2)
	Alcogel	0.42(2)	0.49(2)	0.38(1)	0.51(2)	0.91(2)	0.81(2)	0.78(3)	0.68(3)	0.63(1)
	Aerogel	0.030(2)	0.032(2)	0.017(1)	0.038(1)	0.050(1)	0.012(1)	0.019(1)	0.033(2)	0.019(1)
	Rehydrated	0.17(2)	0.19(1)	0.10(1)	0.34(3)	0.31(2)	0.084(9)	0.40(2)	0.43(2)	0.13(1)

[a] D, mm; h, mm represent diameter & height of the hydrogel.