

Supporting Information

High oxygen barrier property of poly(propylene carbonate)/polyethylene glycol nanocomposites with low loading of cellulose nanocrystal

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Table S1 Decomposition temperature and ΔC_p of pure PPC and PPC/PEG/CNC
nanocomposites

Sample	$T_{-5\%}/^{\circ}\text{C}$	$T_{-95\%}/^{\circ}\text{C}$	$T_{max}/^{\circ}\text{C}$	$\Delta C_p (\text{J}\cdot\text{g}^{-1}\cdot\text{K}^{-1})$
Pure PPC	210.5	350.5	300.0	0.445
PPC/PEG	238.7	404.1	292.5	0.356
PPC/PEG/0.1CNC	235.7	401.3	261.8	0.406
PPC/PEG/0.3CNC	241.3	401.1	262.9	0.375
PPC/PEG/0.5CNC	242.8	402.3	273.8	0.329
PPC/PEG/0.7CNC	246.5	404.4	277.9	0.392

Table S2 Permeability coefficient of typical polymer/biopolymer nanocomposites at different loadings and environmental relative humidity (RH)

Film type	Filler content	RH (%)	$OP \times 10^{13}$ ($\text{cm}^3 \cdot \text{m} \cdot \text{m}^{-2} \cdot \text{s}^{-1} \cdot \text{Pa}^{-1}$)	Reference
EVA/nanoclay	10 wt%	0	3.15	50
Nano-BOPP/PCL	7 wt%	0	0.49	51
PET/Nanoter	5 wt%	0	1.69	52
PHB/Nanoter	5 wt%	0	1.78	52
PLA/MEE	4 wt%	90	6.8	53
PPC/PEG/CNC	0.7 wt%	45	0.278	This study

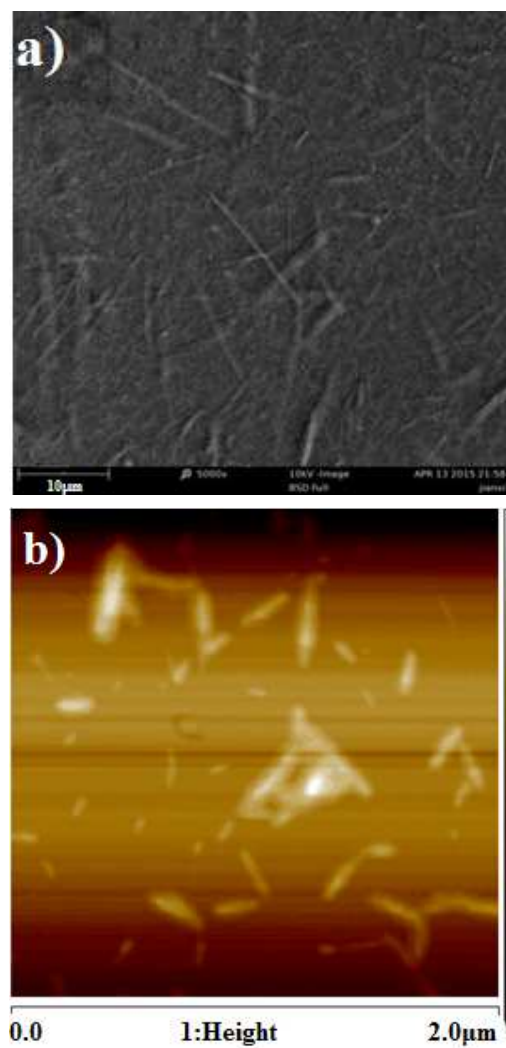


Figure S1 Photomicrographs of CNC observed via (a) SEM and (b) AFM

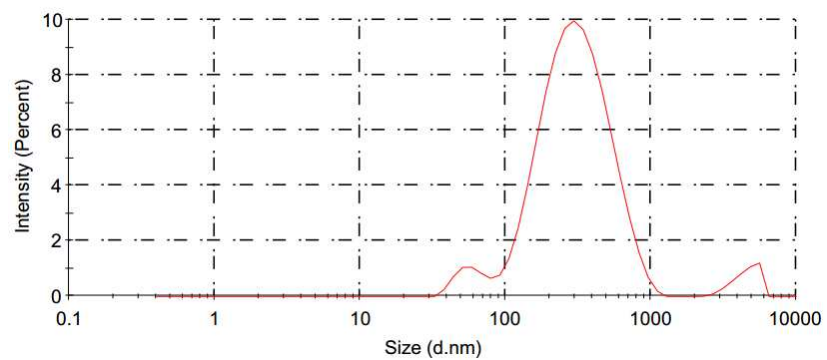


Figure S2 The size distribution of CNC

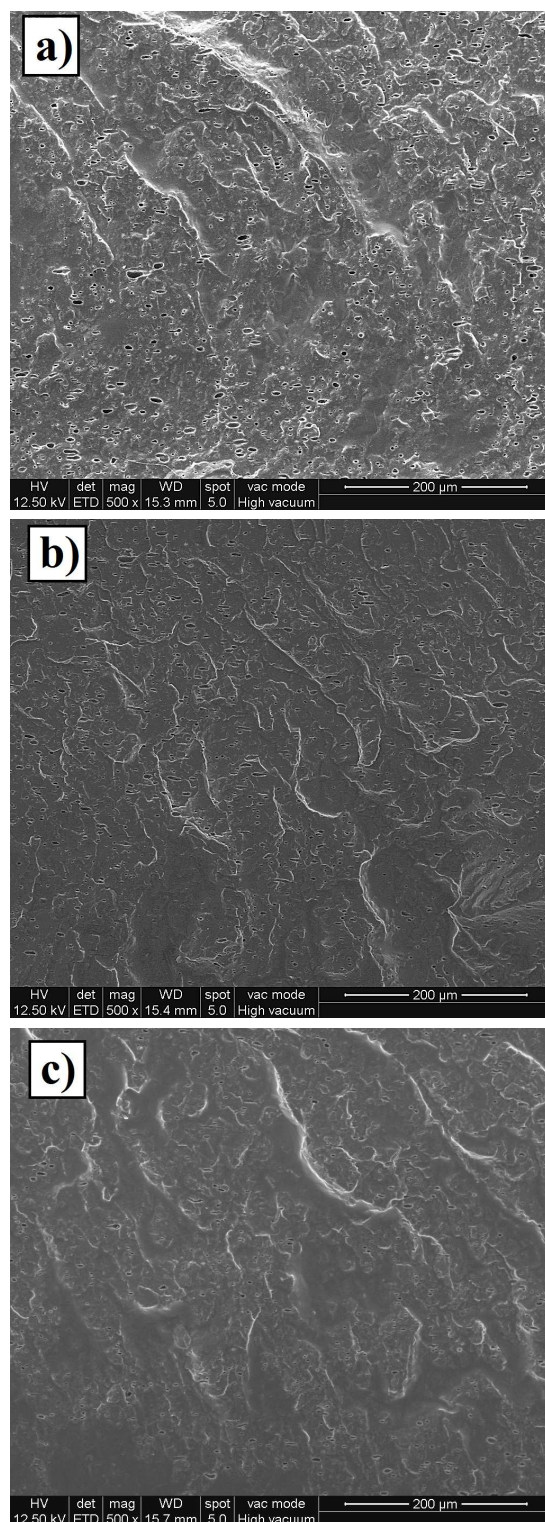


Figure S3 SEM microphotographs for (a) PPC/PEG, (b) PPC/PEG/0.1CNC and (c) PPC/PEG/0.5CNC