



Figure S1. FTIR plots of (left row of graphs): untreated and coated with CV films (a) un-LDPE_CV, (c) un-LDPE/10HNT_CV, (e) un-LDPE/10CV@HNT_CV and of (right row of graphs): corona treated and coated with CV films (b) tr-LDPE_CV, (d) tr-LDPE/10HNT_CV, and (f) tr-LDPE/10CV@HNT_CV on day1, day 2, day 3, day 4, day 7, day 9, day 11, and day 14.

Table S1. Calculated Young's Modulus (E), ultimate strength (σ_{uts}) and %elongation at break mean values along with standard deviation values and statistical analysis results.

	Young 's Modulus E (MPa)	ultimate strength σ_{uts} (MPa)	% elongation at break % ϵ
LDPE	171.0 \pm 10.00 ^{a,c,d}	10.4 \pm 0.4 ^{a,b,d}	28.9 \pm 0.8 ^{a,b,c,d,e}
LDPE/10HNT	316.3 \pm 14.14 ^{a,b,d}	11.5 \pm 1.3 ^a	16.7 \pm 1.7 ^{a,e}
LDPE/10CV@HNT	333.3 \pm 14.77 ^{b,d}	12.1 \pm 1.2 ^a	17.5 \pm 2.6 ^{a,b,e}
un-LDPE_CV	135.4 \pm 25.13 ^{c,f}	7.5 \pm 0.8 ^{b,c,d}	32.4 \pm 8.6 ^{b,c,d,e}
un-LDPE/10HNT_CV	151.5 \pm 26.81 ^{c,d}	7.2 \pm 0.9 ^c	24.4 \pm 3.8 ^{a,b,d,e}
un-LDPE/10CV@HNT_CV	120.3 \pm 12.42 ^c	7.3 \pm 0.9 ^d	57.7 \pm 6.0 ^{c,d}
tr-LDPE_CV	265.0 \pm 38.64 ^{d,e}	11.2 \pm 1.4 ^a	32.9 \pm 7.6 ^{d,e}
tr-LDPE/10HNT_CV	174.4 \pm 25.40 ^{a,c,e}	8.8 \pm 0.5 ^{a,c,d}	37.4 \pm 8.2 ^{d,e}
tr-LDPE/10CV@HNT_CV	226.8 \pm 9.46 ^{a,b,d,f}	8.1 \pm 1.0 ^{b,c,d}	26.1 \pm 6.4 ^e

a-f: Different letters in each column indicate statistically significant differences at the confidence level $p < 0.05$.

Table S2. Calculated WVTR, D_{wv} , O.T.R. and PeO_2 mean values along with standard deviation values and statistical analysis results for all tested films.

	film thickness (mm)	WVTR (10^{-7} g/(cm ² ·s))	D_{wv} (10^{-4} cm ² /s)	film thickness (mm)	OTR (mL·m ⁻² ·day ⁻¹)	PeO_2 (10^{-8} cm ² /s)
LDPE	0.13 \pm 0.03	5.58 \pm 0.51	1.68 \pm 0.14 ^{a,c,e}	0.12 \pm 0.03	1978.7 \pm 154.2	2.63 \pm 0.21 ^a
LDPE/10HNT	0.14 \pm 0.02	3.20 \pm 1.02	1.10 \pm 0.36 ^{a,b}	0.12 \pm 0.02	1660.7 \pm 217.5	2.21 \pm 0.29 ^{a,b,c}
LDPE/10CV@HNT	0.12 \pm 0.02	1.22 \pm 0.91	4.71 \pm 0.20 ^b	0.12 \pm 0.02	1509.6 \pm 208.2	2.10 \pm 0.29 ^{a,b,c}
un-LDPE_CV	0.12 \pm 0.02	6.41 \pm 0.72	1.91 \pm 0.22 ^{a,c}	0.16 \pm 0.03	1277.5 \pm 88.4	2.37 \pm 0.16 ^{a,b}
un-LDPE/10HNT_CV	0.18 \pm 0.03	4.97 \pm 0.73	2.18 \pm 0.16 ^{c,d}	0.14 \pm 0.02	1153.1 \pm 268.3	1.80 \pm 0.42 ^{b,c}
un-LDPE/10CV@HNT_CV	0.15 \pm 0.02	6.85 \pm 1.12	2.31 \pm 0.32 ^c	0.15 \pm 0.03	997.1 \pm 145.2	1.49 \pm 0.13 ^{b,c}
tr-LDPE_CV	0.17 \pm 0.03	2.95 \pm 0.41	1.16 \pm 0.15 ^{a,b,d}	0.12 \pm 0.02	1797.5 \pm 33.2	2.50 \pm 0.46 ^a
tr-LDPE/10HNT_CV	0.17 \pm 0.03	3.09 \pm 0.33	1.21 \pm 0.06 ^{a,b,d}	0.13 \pm 0.03	1365.6 \pm 240.5	2.05 \pm 0.36 ^{a,b,c}
tr-LDPE/10CV@HNT_CV	0.15 \pm 0.02	2.76 \pm 0.22	0.92 \pm 0.07 ^{b,e}	0.12 \pm 0.02	1074.0 \pm 191.2	1.49 \pm 0.26 ^c

a-e: Different letters in each column indicate statistically significant differences at the confidence level $p < 0.05$.

Table S3. Calculated %wt. CV release content (%RC_{cv}) as well as the CV release rate (RR_{cv}) mean values for all corona treated and untreated active films.

	%RC _{cv}	R _{cv} ($\mu\text{g/s}$)
un-LDPE_CV	11.42 \pm 2.50 ^a	23.44 \pm 7.49 ^a
un-LDPE/10HNT_CV	7.02 \pm 2.45 ^{a,b,c}	15.00 \pm 4.04 ^{a,b}
un-LDPE/10CV@HNT_CV	9.61 \pm 1.28 ^{a,c}	19.78 \pm 2.52 ^a
tr-LDPE_CV	8.91 \pm 2.28 ^{a,b,c}	18.11 \pm 2.22 ^{a,b}
tr-LDPE/10HNT_CV	4.54 \pm 2.05 ^{b,c}	9.78 \pm 4.22 ^b
tr-LDPE/10CV@HNT_CV	5.90 \pm 1.11 ^c	9.67 \pm 6.56 ^{a,b}

a-c: Different letters in each column indicate statistically significant differences at the confidence level $p < 0.05$.

Table S4. Calculated EC₅₀ mean values along with standard deviation values and statistical analysis results for all tested films.

	EC ₅₀ (mg/L)
LDPE	-
LDPE/10HNT	-
LDPE/10CV@HNT	-
un-LDPE_CV	0.839±0.0124 ^a
un-LDPE/10HNT_CV	0.787±0.0399 ^{a,b}
un-LDPE/10CV@HNT_CV	0.730±0.0133 ^{a,b}
tr-LDPE_CV	0.694±0.0542 ^{b,c}
tr-LDPE/10HNT_CV	0.671±0.0272 ^{b,c}
tr-LDPE/10CV@HNT_CV	0.512±0.0590 ^c

^{a-c}: Different letters in each column indicate statistically significant differences at the confidence level $p < 0.05$.