

Electronic Supplementary Information (ESI)

Fabrication of highly stretchable salt and solvent blended PEDOT:PSS/PVA free-standing films: Non-linear to linear electrical conduction response

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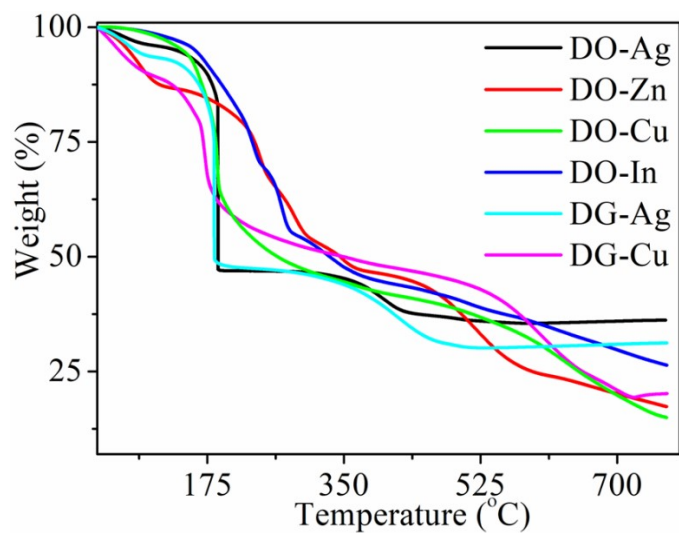


Fig.S1. TGA thermograms of some of the films.

Table S1. Salt agglomerated X-ray diffraction peak positions (θ) and the corresponding inter-planar spacings (d) of DF-Zn, DO-Cu and DO-In films.

DF-Zn		DO-Cu		DO-In	
θ ($^{\circ}$)	d (\AA)	θ ($^{\circ}$)	d (\AA)	θ ($^{\circ}$)	d (\AA)
8.2	10.77	10.8	8.18	12.8	6.91
11.2	7.89	15.5	5.71	13.3	6.65
28.1	3.17	19.1	4.64	15.1	5.86
30.3	2.95	22.0	4.04	16.4	5.40
31.1	2.87	27.1	3.29	20.1	4.41
32.8	2.73	31.4	2.85	22.2	3.40
33.5	2.67	33.3	2.69	22.9	3.88
34.5	2.60	36.9	2.43	23.8	3.73
58.2	1.58	40.3	2.24	25.3	3.52
61.1	1.51	41.2	2.19	26.4	3.37
		42.0	2.15	29.2	3.05
		45.7	1.98	30.5	2.93
		46.5	1.95	34.5	2.60
		49.3	1.85	40.0	2.25
		52.0	1.76	58.8	1.57
		57.9	1.59	73.1	1.29
		67.3	1.39		

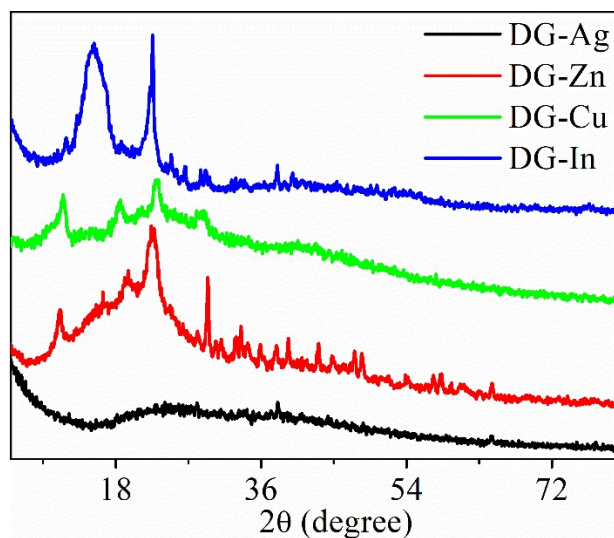


Fig.S2. XRD patterns for DG-Ag, DG-Zn, DG-Cu and DG-In films.

Table S2. FTIR peaks of pure PVA and PP-P films.

Sample	Peak position (cm ⁻¹)	Assigned as
PVA	3259	– OH symmetric stretching vibration
	2942, 2909	C – H stretching vibration of alkyl groups
	1713	C = O stretching
	1645	Adsorbed water
	1086	– C – O stretching vibration
PP-P	1525	C = C stretching vibration (thiophene ring)
	1203	C – O – C stretching vibration
	1034, 1007	Stretching vibration of sulfonic acid group
	973, 667	C – S stretching vibration

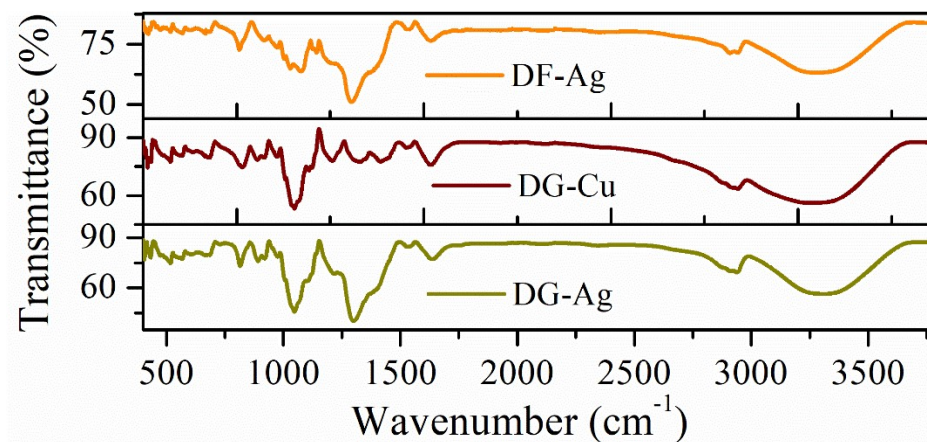


Fig.S3. FTIR spectra of DG-Ag, DG-Cu and DF-Ag films.

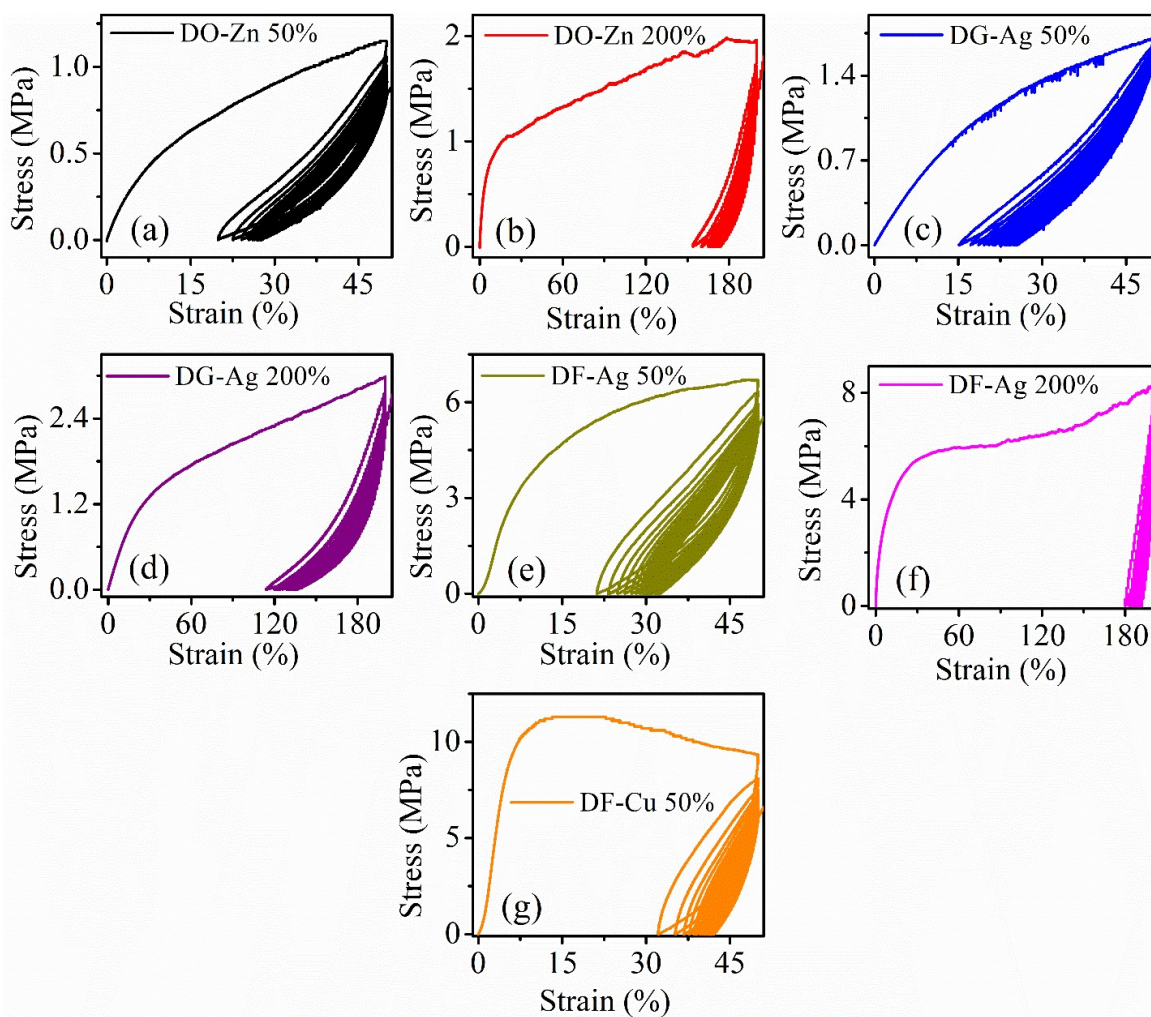


Fig.S4. Loading-unloading plots for twenty consecutive cycles at 50 and 200% strains for DO-Zn, DG-Ag and DF-Ag films and, at 50% strain for DF-Cu film.

Table S3. The estimated hysteresis energies in KJ/m^3 from first to twentieth consecutive cycle at 50 and 200% strains for some of the films.

Cycle number	DO-Zn 50%	DO-Zn 200%	DG-Ag 50%	DG-Ag 200%	DF-Ag 50%	DF-Ag 200%	DF-Cu 50%
1	285.5	2815.0	354.6	3527.4	1986.8	11936.8	4483.5
2	66.8	146.1	72.4	385.8	511.2	375.7	572.2
3	51.0	101.7	54.5	250.8	410.0	244.3	371.0
4	44.8	86.1	48.1	234.4	355.1	210.2	294.0
5	40.7	78.4	41.5	195.2	319.9	164.4	254.8
6	38.0	55.3	38.0	186.4	293.4	137.8	216.4
7	36.6	61.1	34.9	156.5	275.4	122.4	203.9
8	34.1	62.3	36.1	127.3	261.0	111.3	184.8
9	32.5	62.5	30.2	150.3	245.4	97.8	172.2
10	32.4	60.9	32.0	147.6	237.6	92.4	161.5
11	31.5	57.0	29.6	134.6	231.1	85.2	156.0
12	30.3	54.5	28.7	124.2	225.5	80.0	146.2
13	31.0	49.5	28.1	114.7	221.8	79.5	137.1
14	30.1	47.0	27.7	97.4	216.9	73.9	132.0
15	27.6	52.7	26.8	130.5	212.4	72.4	131.5
16	26.5	43.7	25.4	118.0	214.8	66.8	125.7
17	26.2	43.5	26.4	117.8	202.9	65.9	122.3
18	26.9	45.5	24.5	115.1	202.2	63.9	117.4
19	26.9	45.9	23.5	109.5	200.5	63.1	112.1
20	26.7	46.0	23.1	111.3	192.9	61.2	114.2

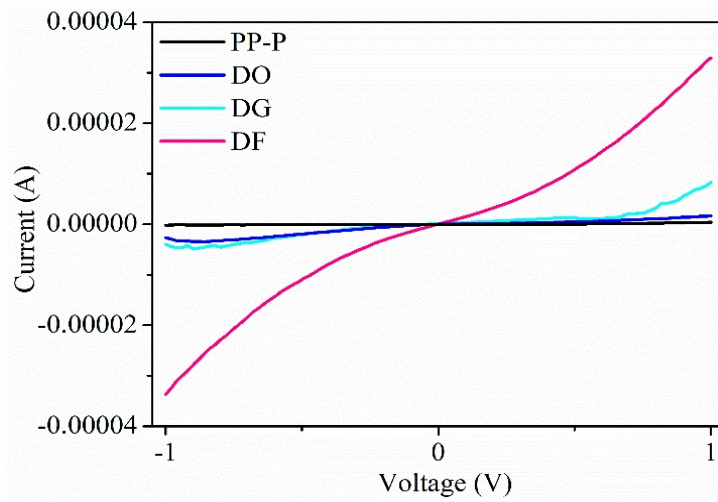


Fig.S5. Non-linear I-V characteristics of PP-P, DO, DG and DF films.