Supplementary material

Sodium hexafluorophosphate mediated enhancement of electrical and electrochemical properties of poly (vinyl alcohol)–chitosan solid polymer electrolytes for EDLCs

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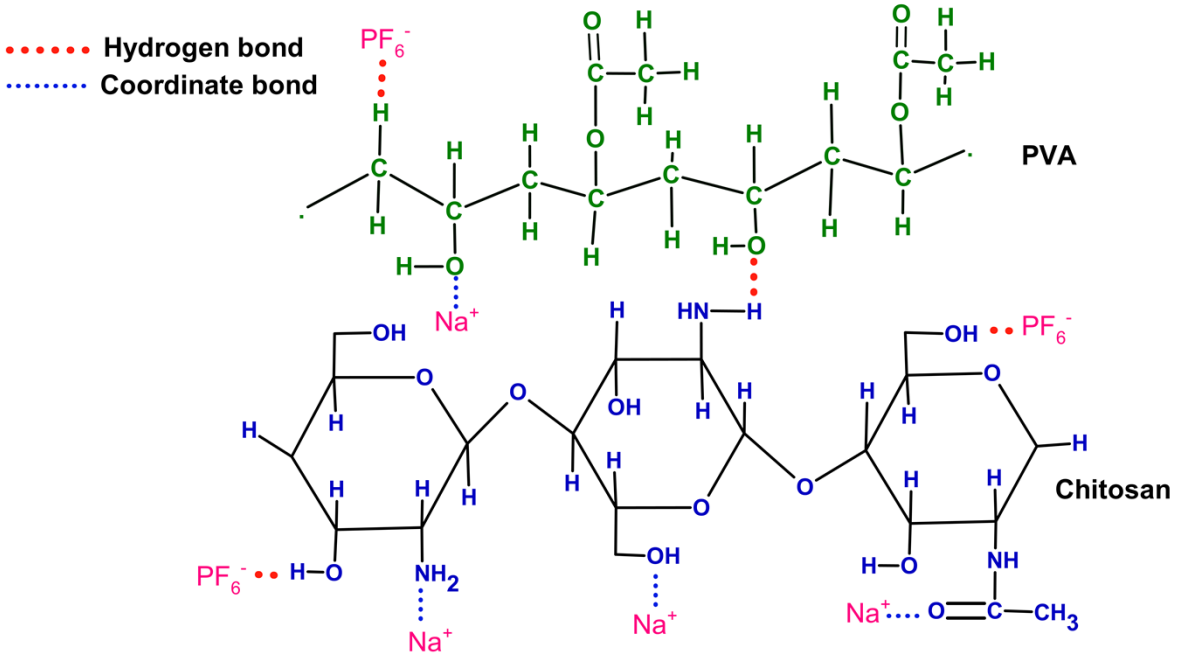

Figure S1: Interaction scheme of dopant with PVA and CS in PVA/CS-$NaPF_6$

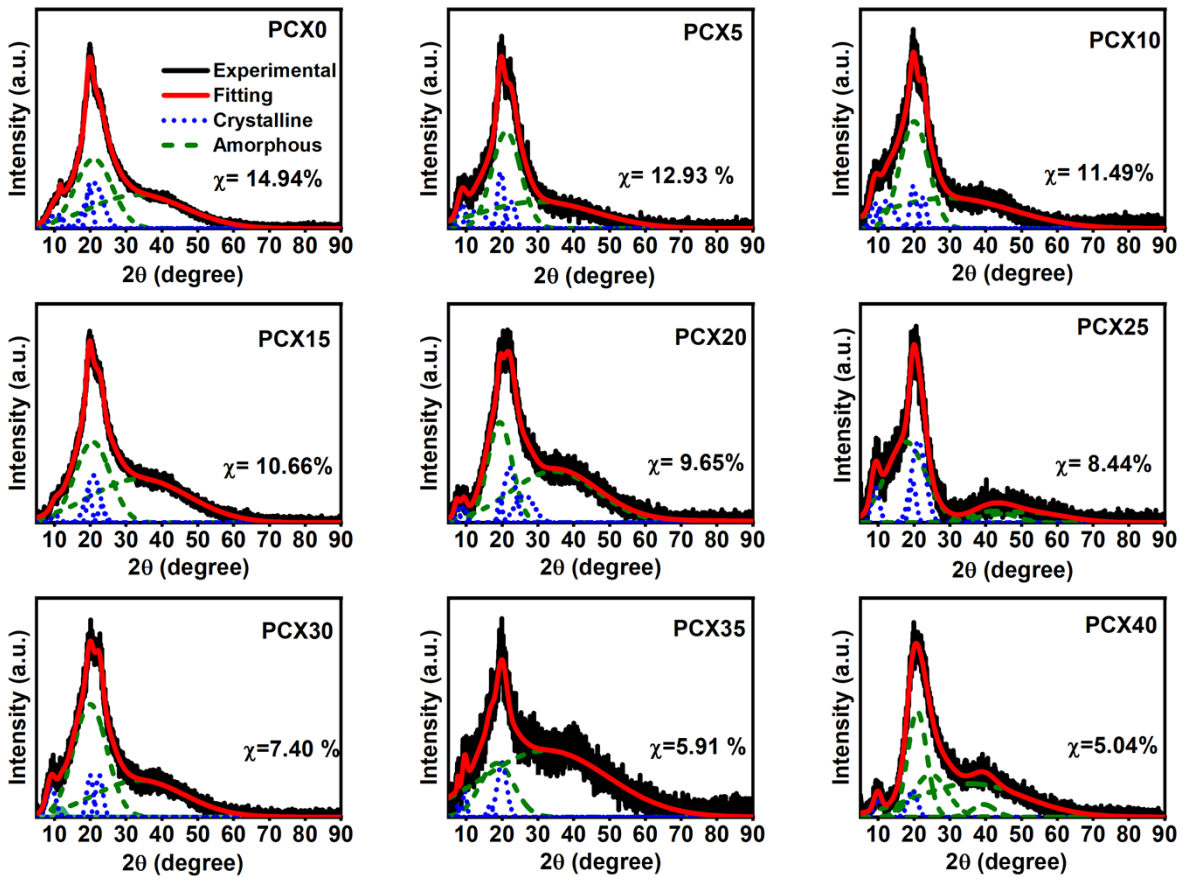

Figure S2: Deconvoluted XRD pattern of PVA/CS-$NaPF_6$ SPEs

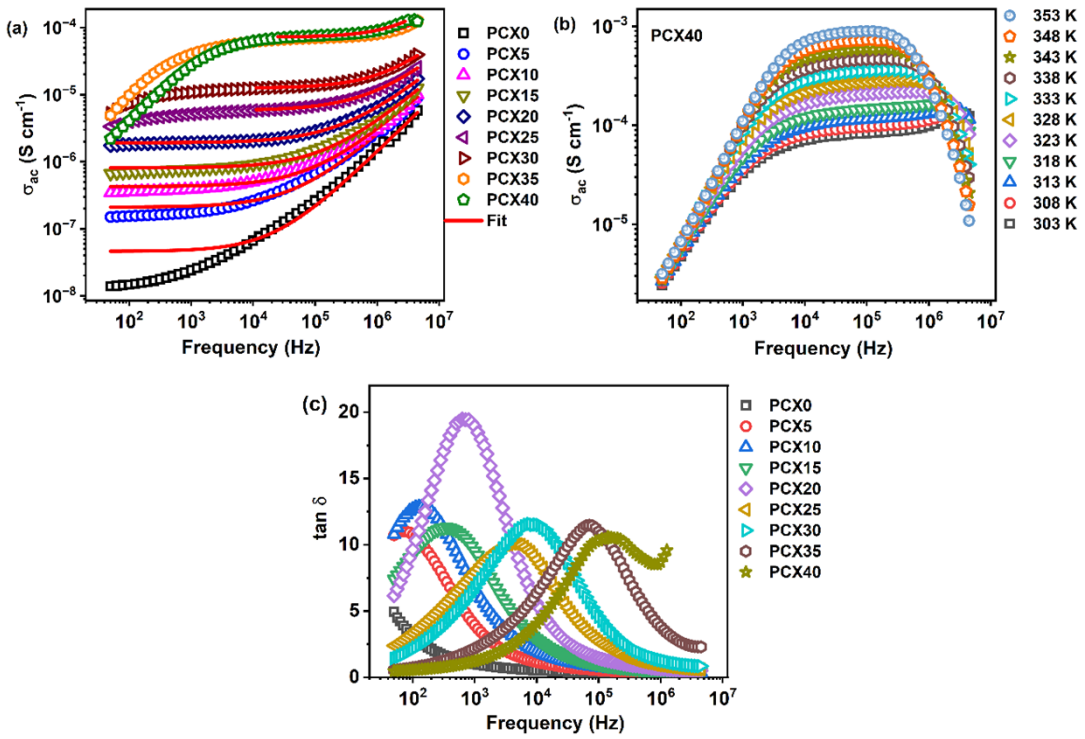

Figure S3: (a) AC conductivity of the PVA/CS-$NaPF_6$ SPEs at room temperature (JPL Fit is given as red solid line) (b) AC conductivity of optimum conductivity sample PCX40 for various elevated temperatures and (c) tangent loss plot for PVA/CS-$NaPF_6$ SPEs at room temperature.

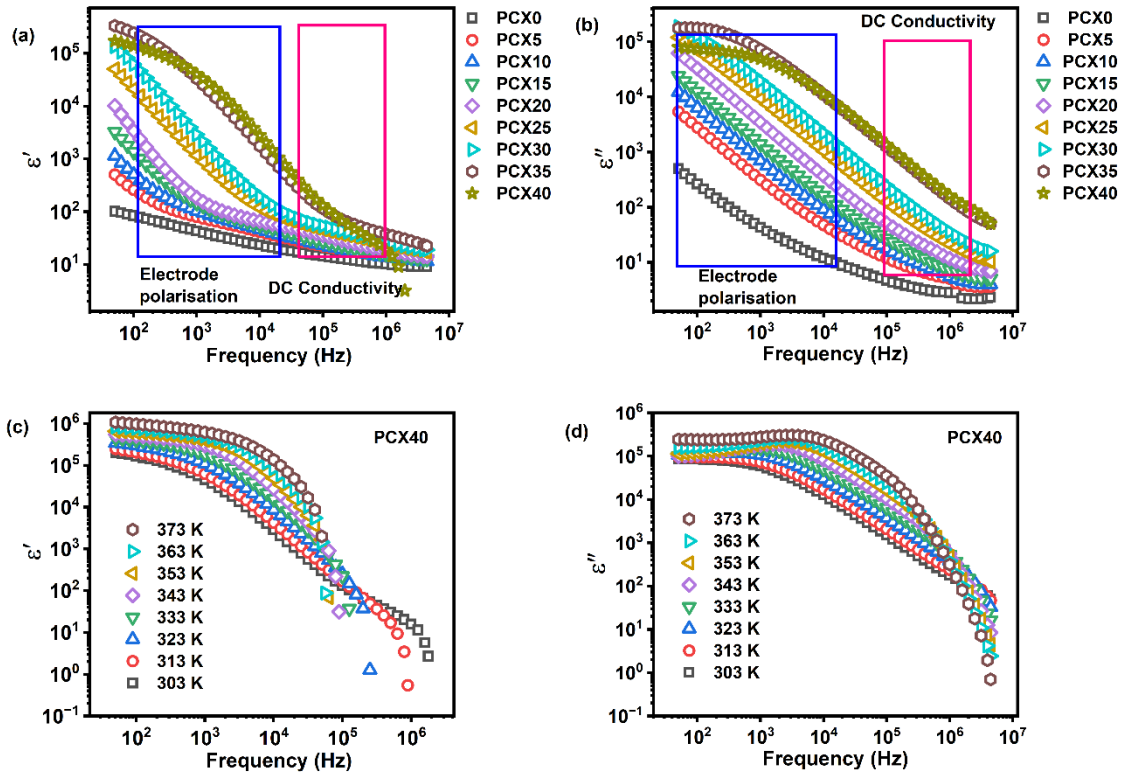

Figure S4: Variation in (a) ϵ', (b) ϵ" for PVA/CS-$NaPF_6$ SPEs, (c)ϵ’ and (d) ϵ" for elevated temperature for optimum conductivity sample PCX40.

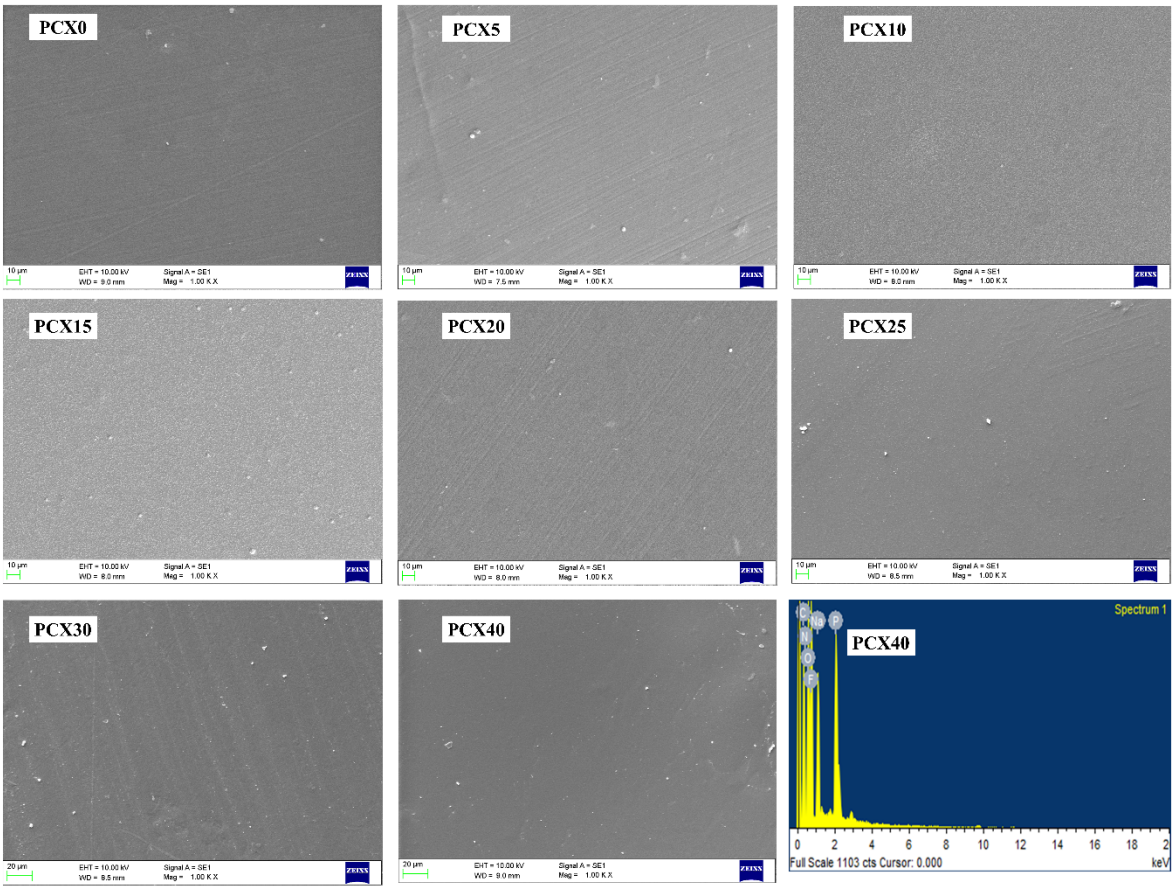

Figure S5: SEM images of selected PCX SPEs and EDAX spectra of PCX40 (at bottom right)

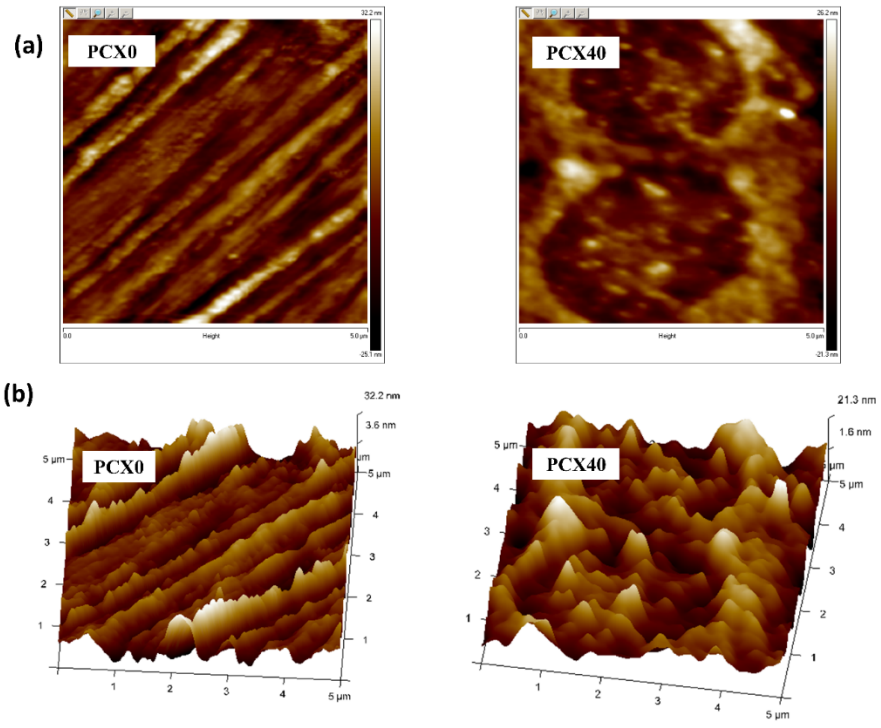

Figure S6: AFM 2D and 3D images of PCX0 and PCX40 SPEs

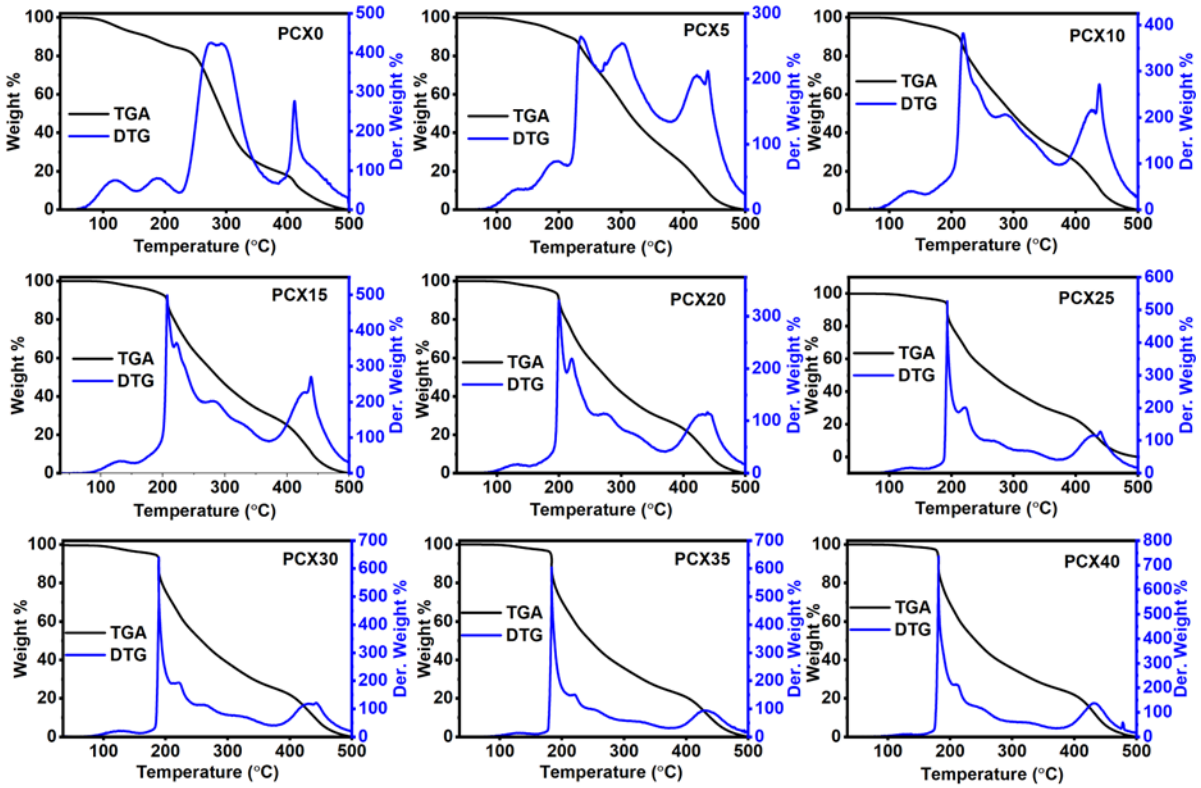

Figure S7: TGA and DTG plots of PVA/CS-$NaPF_6$ SPEs

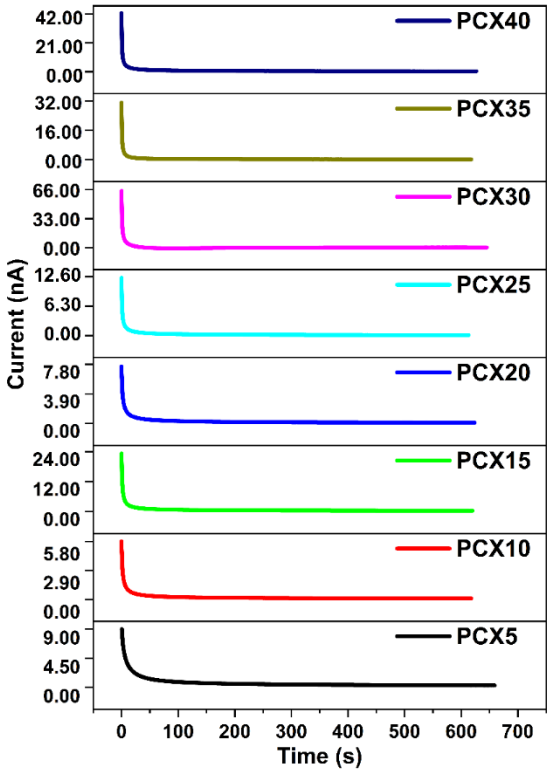

Figure S8: Chronoamperometry (CA) plots PVA/CS-$NaPF_6$ SPEs

Table S1: Values of t_{ion} and σ_{ion} for prepared SPEs obtained from TNM measurements.

Sample	t_{ion}	$\sigma_{i(\text{S cm}^{-1})}$
PCX5	0.971	1.672×10^{-7}
PCX10	0.984	3.767×10^{-7}
PCX15	0.985	7.757×10^{-7}
PCX20	0.986	1.819×10^{-6}
PCX25	0.992	6.110×10^{-6}
PCX30	0.997	1.277×10^{-5}
PCX35	0.996	5.475×10^{-5}
PCX40	0.992	6.881×10^{-5}

Table S2: Mechanical properties of PVA/CS-$NaPF_6$ SPEs

Sample	Tensile strength (MPa)	Elongation at break (%)	Young's modulus (MPa)
PCX0	55 ± 2.6	8.1 ± 1.1	2.1E3 ± 7.0 E2
PCX5	32 ± 4.5	27 ± 3.6	5.1E3 ± 1.1E2
PCX10	27 ± 1.8	27 ± 2.7	3.3E2 ± 3.7
PCX15	24 ± 11	27 ± 11	2.0E2 ± 25
PCX20	21 ± 6.2	30 ± 4.6	1.5E2 ± 39
PCX25	13 ± 5.3	24 ± 8.1	70 ± 30
PCX30	13 ± 5.0	37 ± 14	54 ± 9.9
PCX35	6.1 ± 0.89	23 ± 1.4	41 ± 3.9
PCX40	7.3 ± 0.65	31 ± 2.7	29 ± 1.3