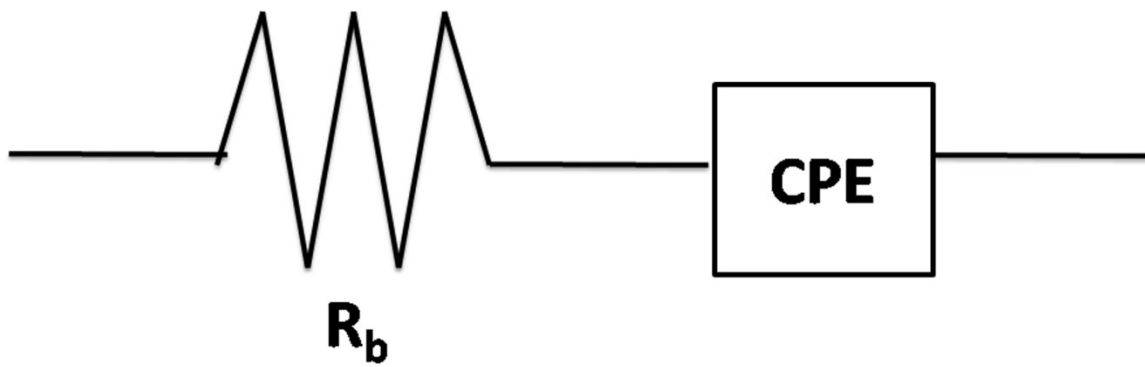
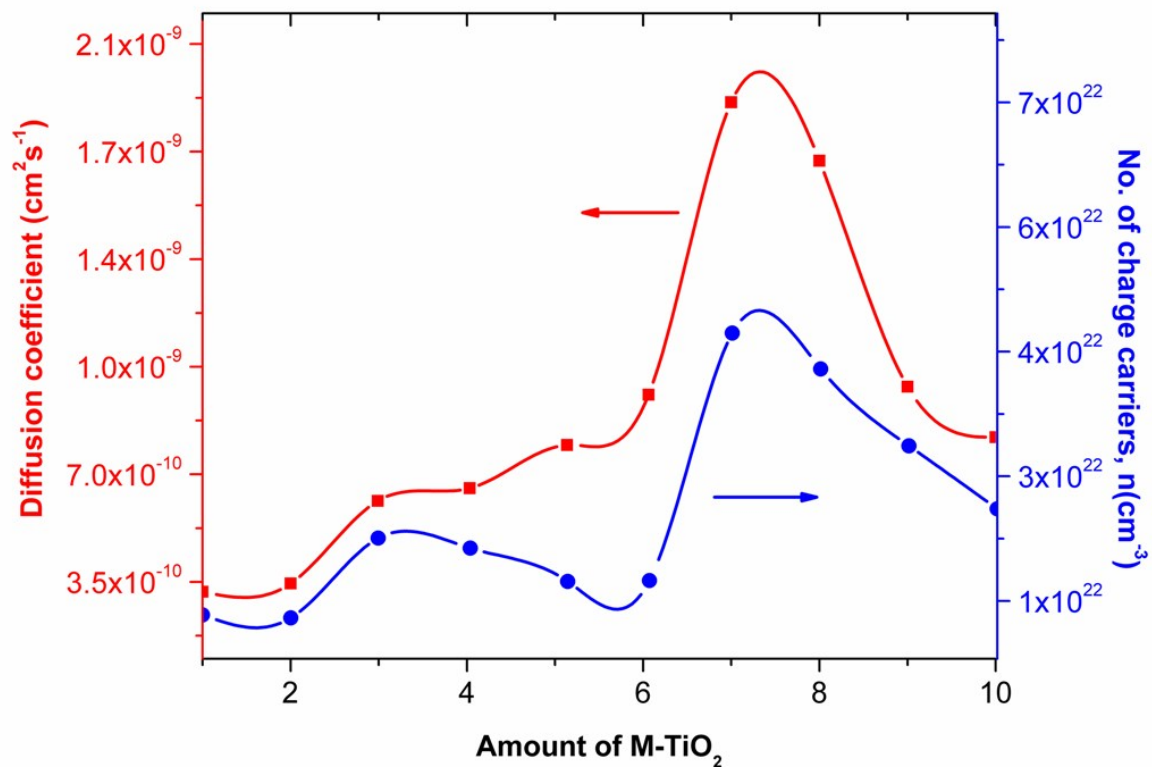


Fig. s1†. DSC thermograms of (a) PEO (b) PVDF-HFP (c) PEO/PVDF-HFP (d) PVDF-HFP/U-TiO<sub>2</sub> and (e) PEO/PVDF-HFP/M-TiO<sub>2</sub>



**Fig. s2†. Equivalent circuit for fitting the electrochemical impedance data**



**Fig. s3†. Diffusion Coefficient and No. of charge carriers of PEO/PVDF-HFP electrolyte membrane with different amount of silane treated TiO<sub>2</sub> nanoparticles**

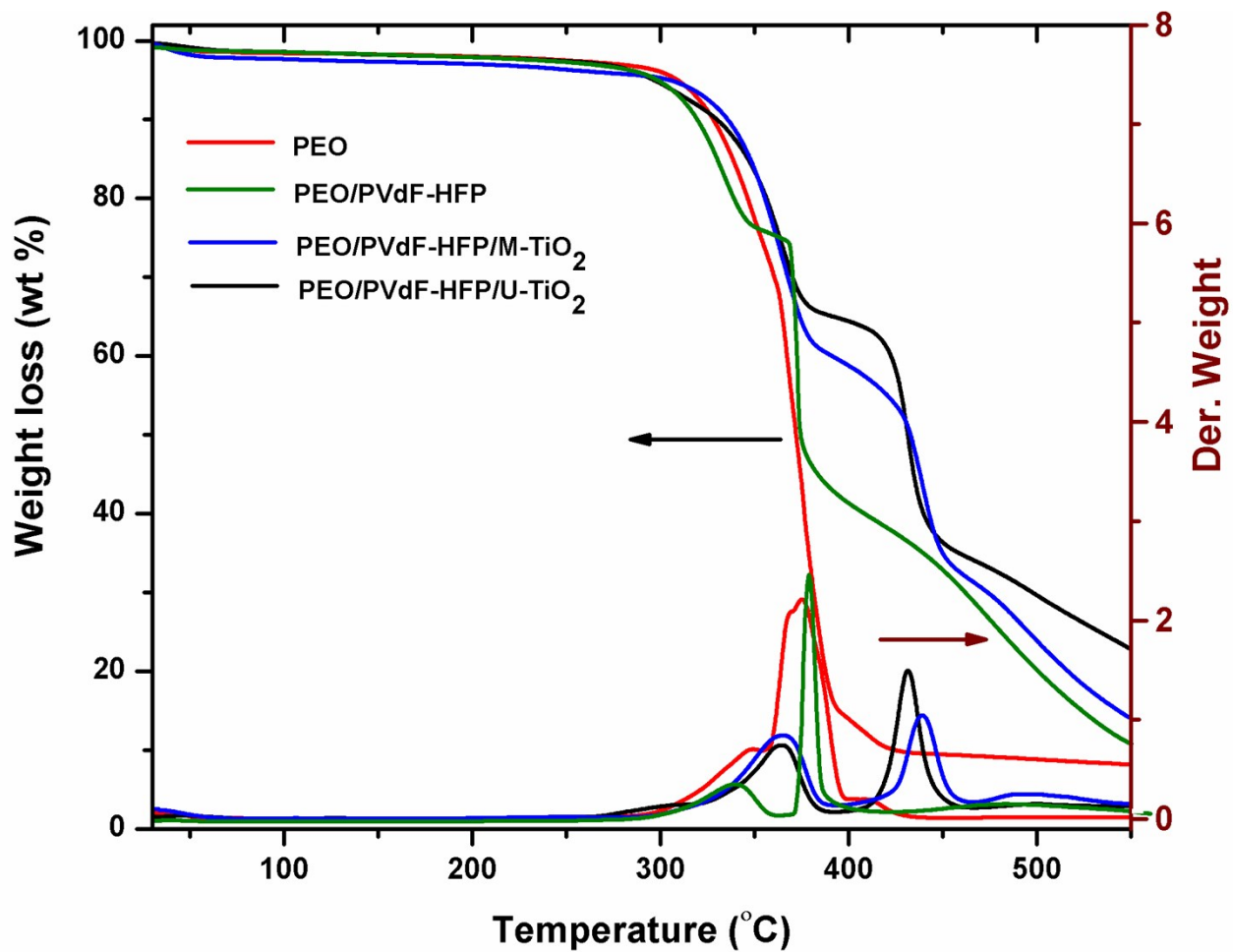
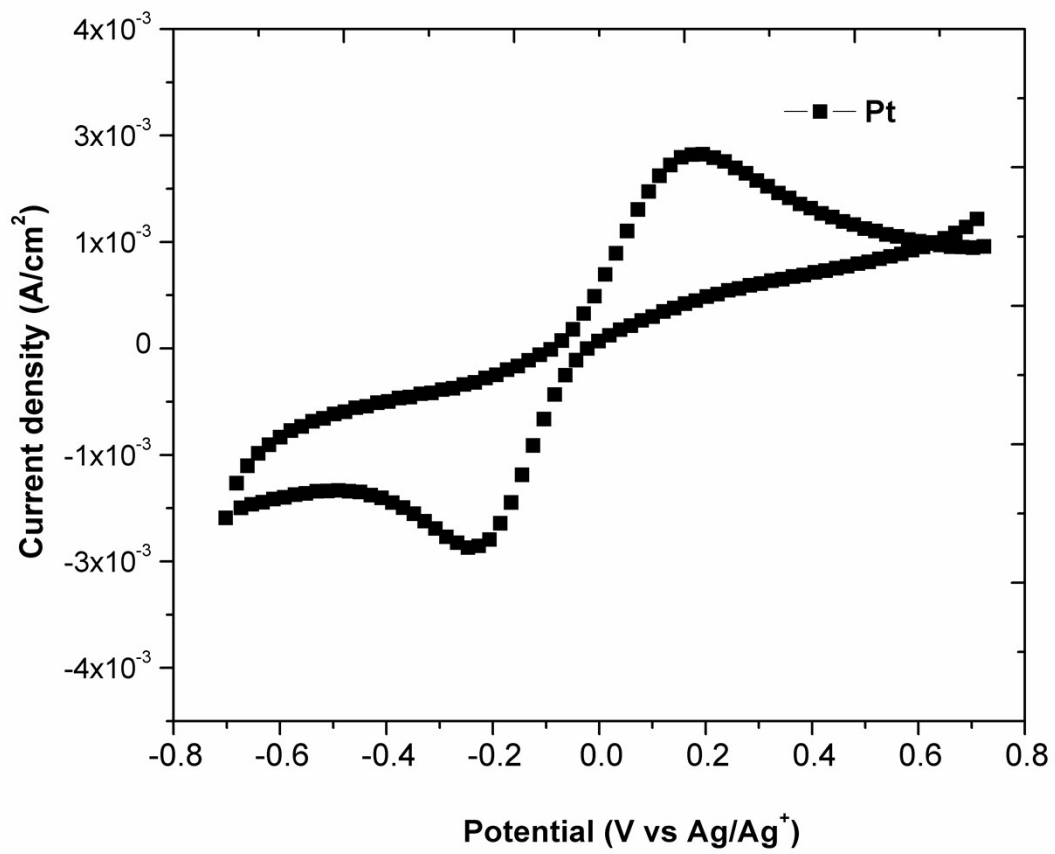


Fig.s4†. TGA and DTA curve of polymer electrolyte membranes



**Fig.s5†. Cyclic voltammetry studies of Pt counter electrodes**

**Table. S1†.** The parameters obtained by fitting the impedance spectra of DSSC by using the equivalent circuit is given in Fig.(inset)

<b>Electrolyte</b>	<b>PEO/PVdF-HFP</b>	<b>PEO/PVdF-HFP/U-TiO<sub>2</sub></b>	<b>PEO/PVdF-HFP/M-TiO<sub>2</sub></b>
$R_{ct1}/ \Omega$	34	33	31
$R_{ct2}/ \Omega$	120	110	96
$R_{diff}/ \Omega$	60	53	37