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Improved electrochromic device performance from silver grid on flexible transparent conducting electrode prepared by electrohydrodynamic jet printing

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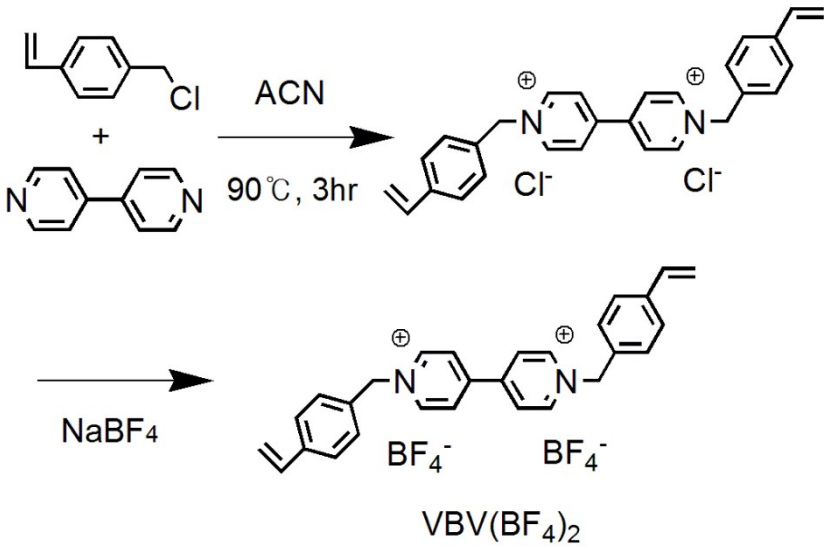

Figure S1. Synthesis of $VBV(BF_4)_2$. Vinyl benzyl chloride, 4,4-bipyridyl and acetonitrile are reacted at 90℃ for 3h. to obtain $VBV\ (Cl2)_2$. Then, $VBV(BF_4)_2$ is obtained by ion exchange reaction.

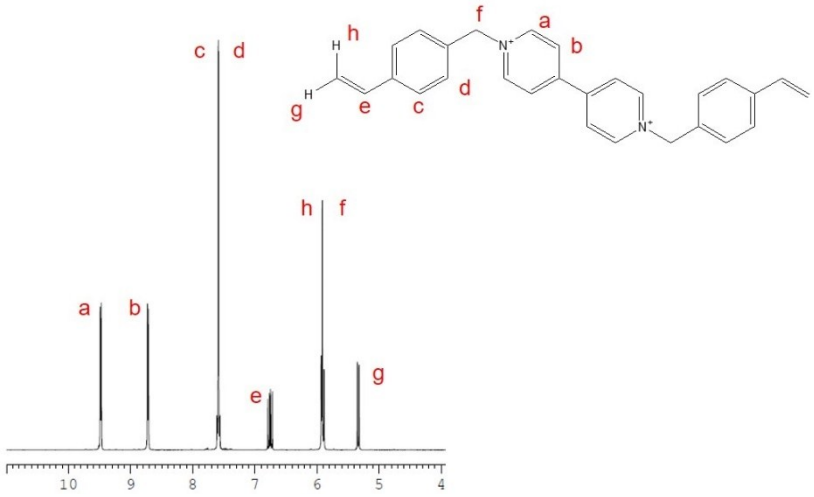

Figure S2. ^{1}H NMR spectra in DMSO (Sigma-Aldrich) of $VBV(BF_4)_2$. The NMR spectra obtained by Bruker model digital AVANCE Ⅲ 400 MHz (Bruker).

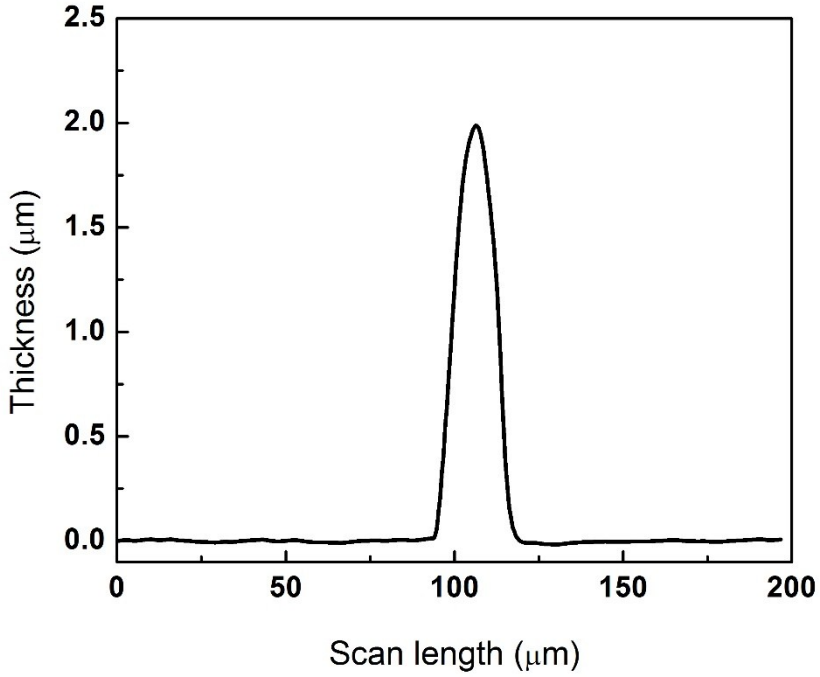

Figure S3. Surface profile of silver grid printed at glass substrate using surface profilometer (Dektak 150, Veeco). Silver grid thickness are 2um.

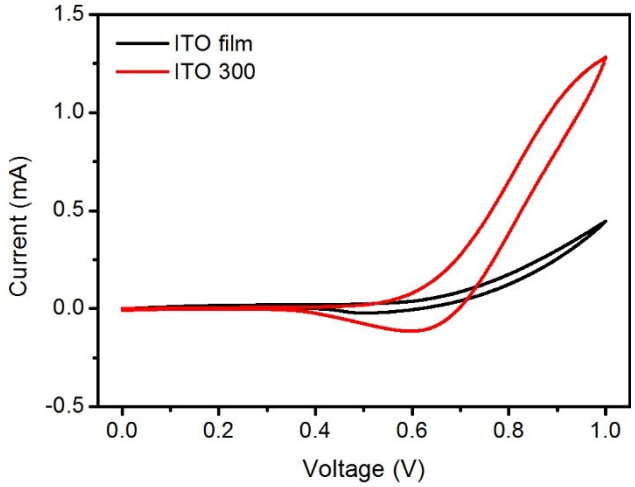

Figure S4. Cyclic voltammogram of the ITO film and ITO 300 with the scan rate of 10 mV s^{-1}

Electrode	Parameter	Bleached state	Coloured state
ITO film	Lv (cd/m^2)	205.60	115.40
	x	0.3302	0.2724
	y	0.3497	0.3001
ITO 200	Lv (cd/m^2)	152.80	19.02
	x	0.3306	0.2041
	y	0.3544	0.1744
ITO 300	Lv (cd/m^2)	162.60	18.74
	x	0.3312	0.2018
	y	0.3559	0.1705
ITO 400	Lv (cd/m^2)	175.90	11.86
	x	0.3309	0.2030
	y	0.3556	0.1527
ITO 500	Lv (cd/m^2)	180.4	57.79
	x	0.3303	0.2360
	y	0.3571	0.2543

Table S1. Comparison of colour contrast value of ITO film and silver gird printed ITO film.