Electronic Supplementary Information (ESI)

Flexible electrochromic devices based on tungsten oxide and Prussian blue nanoparticles for automobile applications

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Table S1 Properties of the PB- and WO$_3$-NP dispersible inks with varying PVA contents of 10 and 1 wt.%, respectively.

|                        | PB-10 wt% PVA ink | WO$_3$-1 wt% PVA ink |
|------------------------|-------------------|----------------------|
| Surface tension (mN/m) | 45.1              | 52.3                 |
| Viscosity (cP)         | 19.4              | 7.3                  |
| Density (g/cm$^3$)     | 1.08              | 4.07                 |
| pH                     | 6.7               | 4.9                  |
| Contact angle (°)      | 93.6              | 48.8                 |
| (before UV treatment)  |                   |                      |
| Contact angle (°)      | 48.8              | 46.4                 |
| (after UV treatment)   |                   |                      |

Table S2 Spin-coating conditions for the preparation of 1 μm-thick WO$_3$ and PB thin films.

| Viscosity (cP) | Revolution (rpm) | Time (s) |
|----------------|-------------------|----------|
| 1–10           | 300               | 600 s    |
| 10–14           | 360               | 600 s    |
| 14–17           | 400               | 600 s    |
|                 | 500               | 10 s     |
| 17–35           | 1000              | 10 s     |
### Table S3 Estimated thicknesses of the WO$_3$ and PB thin films.

| Substrate  | Sample | substrate area (cm$^2$) | substrate before spin coating (g) | substrate after spin coating (g) | Amount of coated (g) | Estimated film thickness (μm) |
|------------|--------|-------------------------|----------------------------------|---------------------------------|----------------------|-------------------------------|
| ITO/PET    | WO$_3$ | 25                      | 0.3722                           | 0.3823                          | 0.0101               | 1.24                          |
|            | PB     | 25                      | 0.3740                           | 0.3770                          | 0.0031               | 1.11                          |
| ITO/glass  | WO$_3$ | 25                      | 4.4302                           | 4.4394                          | 0.0092               | 1.13                          |
|            | PB     | 25                      | 4.3854                           | 4.3882                          | 0.0028               | 1.04                          |

### Table S4 Details of the haze and chromaticity of PET-based and glass-based ECDs in the coloured and transparent states.

| Substrate | colour states | Estimate colour | Haze | L* | a*  | b*  |
|-----------|---------------|-----------------|------|----|-----|-----|
| PET       | Coloured      | 3.61            | 47.67| -18.28 | -38.89 |
|           | Transparent   | 2.93            | 91.35| -2.63  | 3.6   |
| Glass     | Coloured      | 3.06            | 41.99| -15.51 | -42.96 |
|           | Transparent   | 4.19            | 88.94| -7.58   | 1.65   |
Table S5: Transmittance (T), optical density (OD), coloration efficiency (CE), and optical switching time at a wavelength of 633 nm for ECDs fabricated under different light aging conditions in their colored and bleached states.

| Wavelength (nm) | Substrate | ECD area (cm²) | T_bleached (%) | T_colored (%) | Charge (C) | Current density (A/cm²) | ΔOD | CE (cm²/C) |
|----------------|-----------|----------------|----------------|---------------|------------|------------------------|-----|------------|
| 633            | PET       | 16             | 79.89          | 1.31          | 0.23       | 0.01                   | 1.88| 1.78       | 123.32     |
|                | Glass     | 16             | 80.00          | 0.32          | 0.44       | 0.03                   | 2.50| 2.40       | 86.44      |

Figure S1: The *in situ* optical density change with respect to the charge density of PET-based and glass-based ECDs.