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SUPPLEMENTARY INFORMATION

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Supplementary Information

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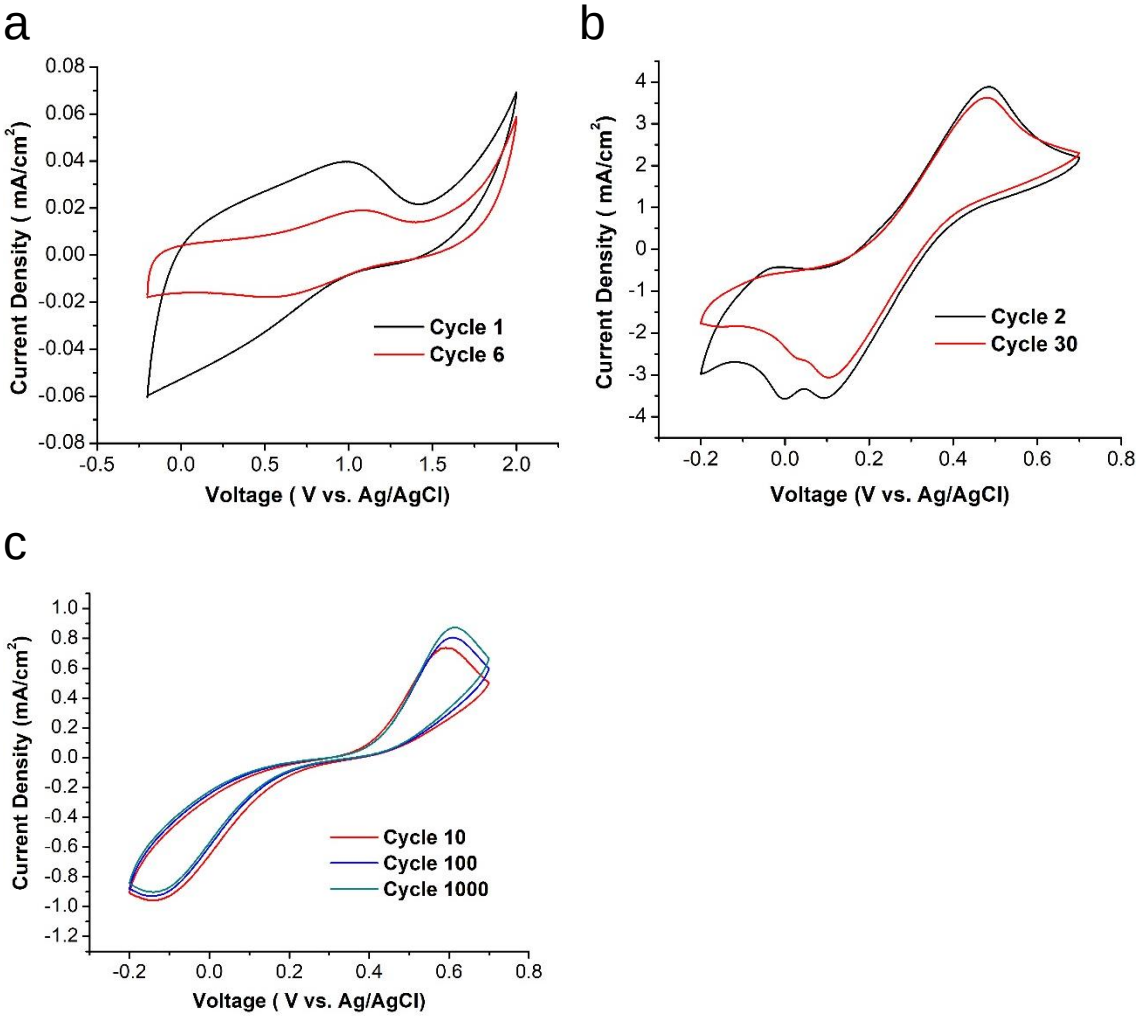
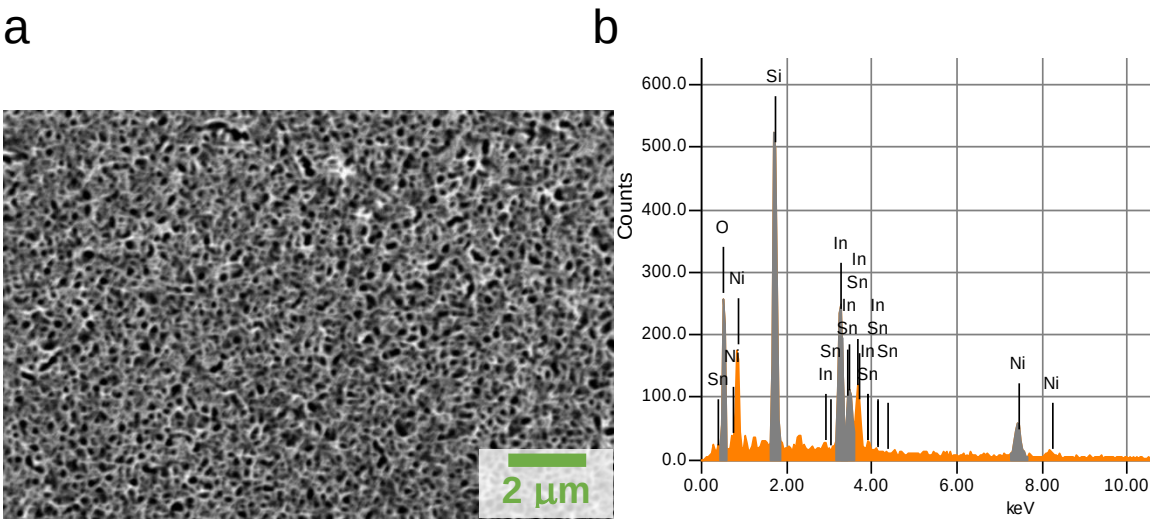
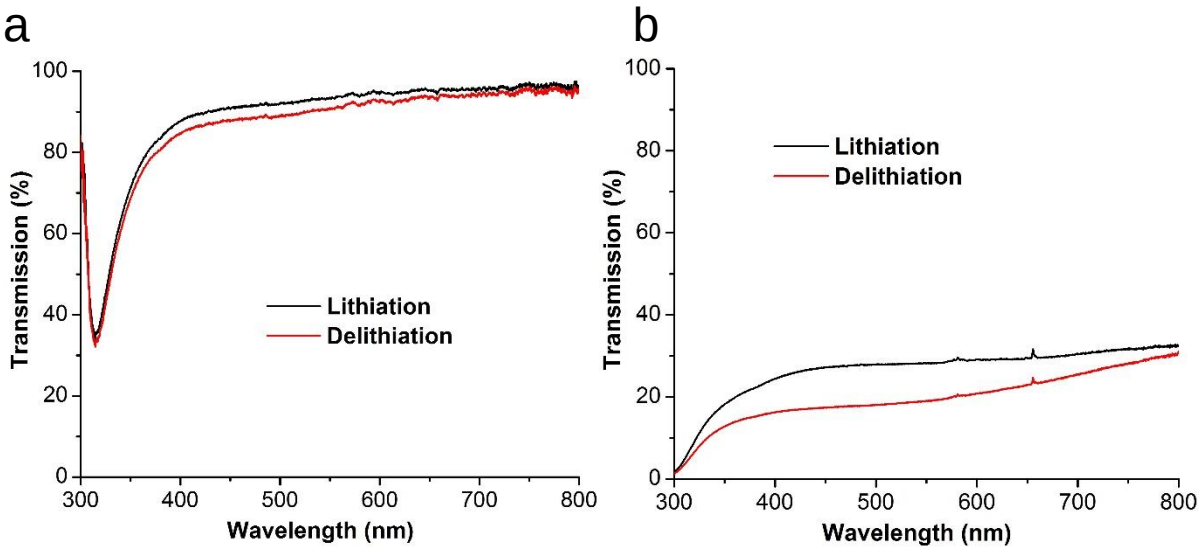


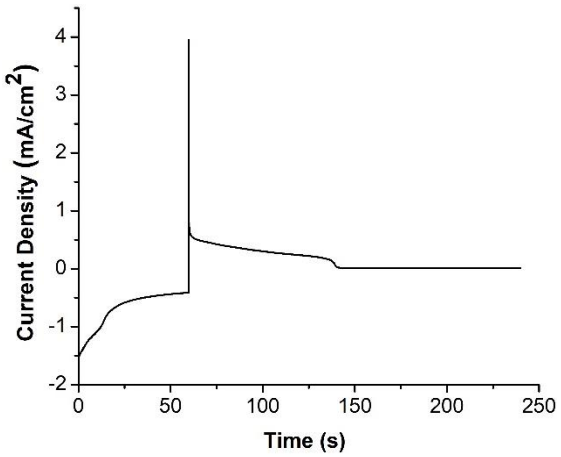
Supplementary Figure 1: Cyclic voltammograms of ITO on glass electrodes coated with CeO_2 (a), V_2O_5 (b), and NiO (c) in the aqueous Cu-Bi electrolyte.



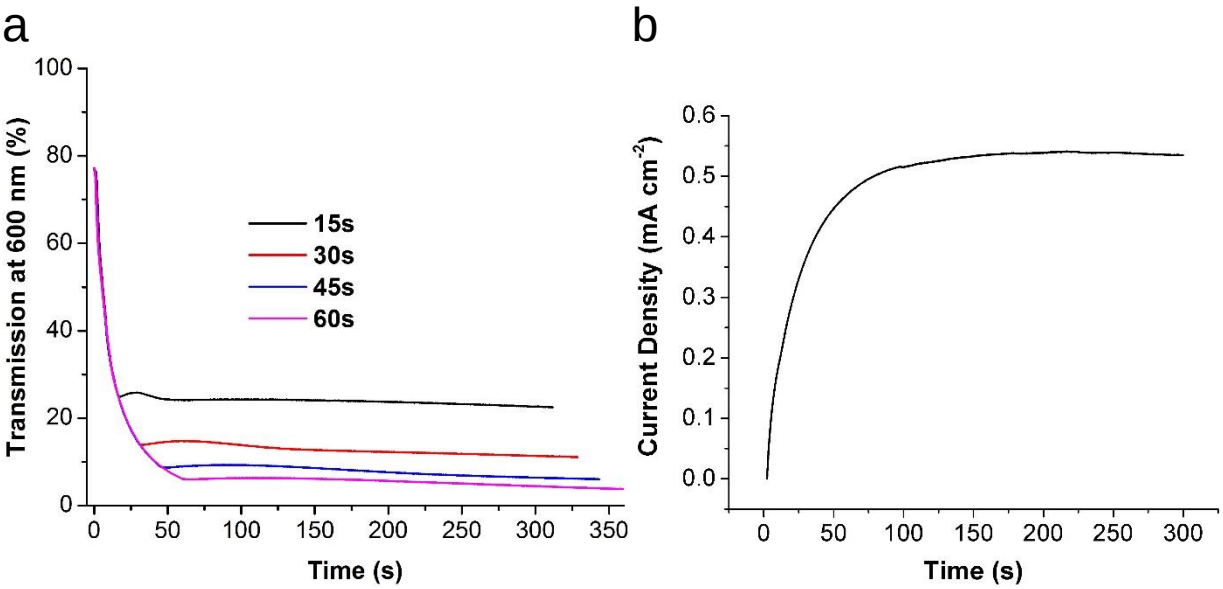
Supplementary Figure 2: SEM image of $LiNiO_x$ (a) and the corresponding EDX spectrum (b), which confirms the presence of NiO and also exhibits In and Sn peaks from ITO and Si peaks from the glass.



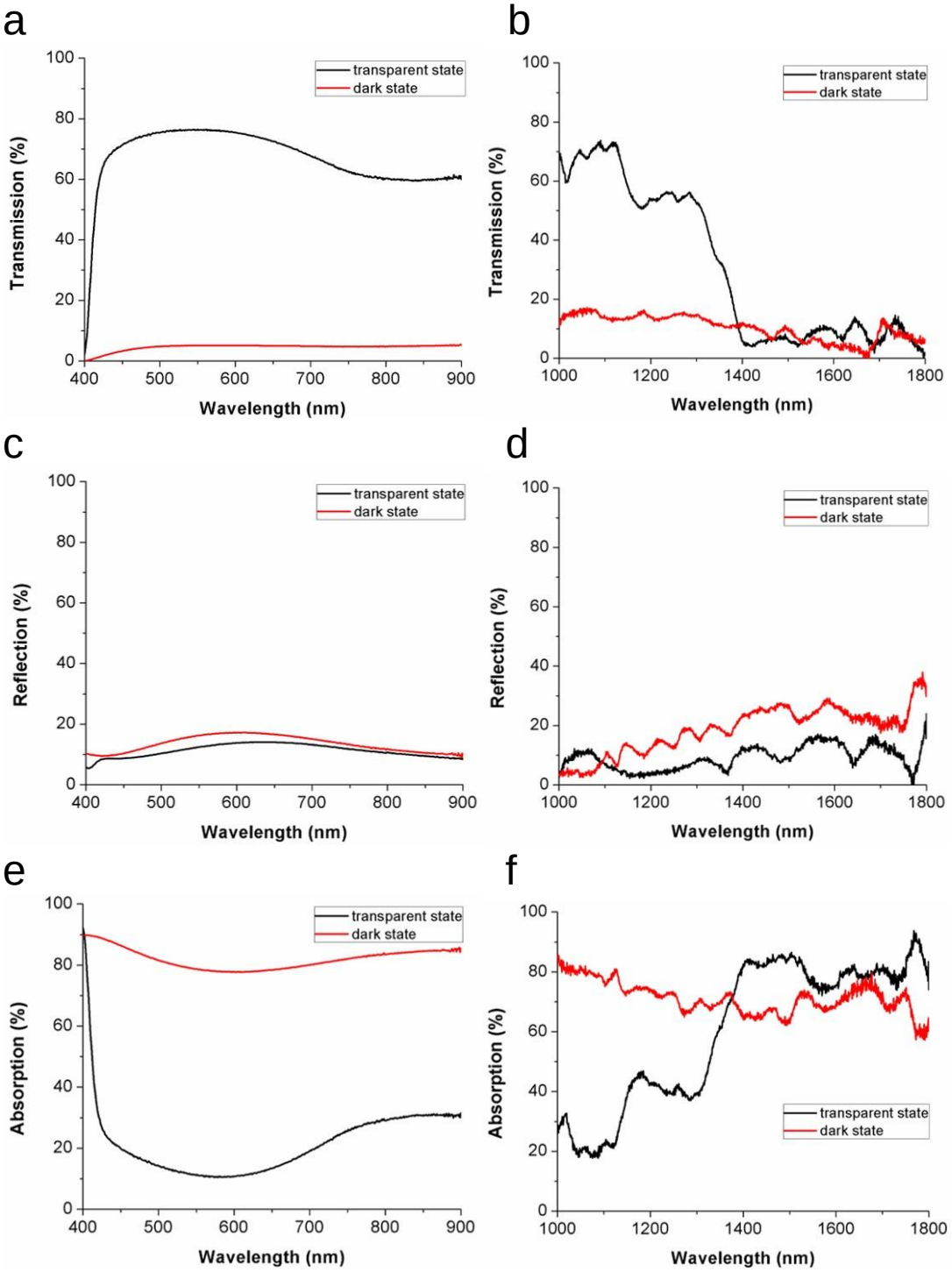
Supplementary Figure 3: Transmission of a 60-nm-thick (a) and 1-µm-thick (b) NiO film on an ITO on glass working electrode in a three-electrode cell using a 1 M LiBr electrolyte. A voltage of -0.01 V was applied for 180 s to lithiate the electrode and 0.67 V was applied for 60 s to delithiate the electrode.



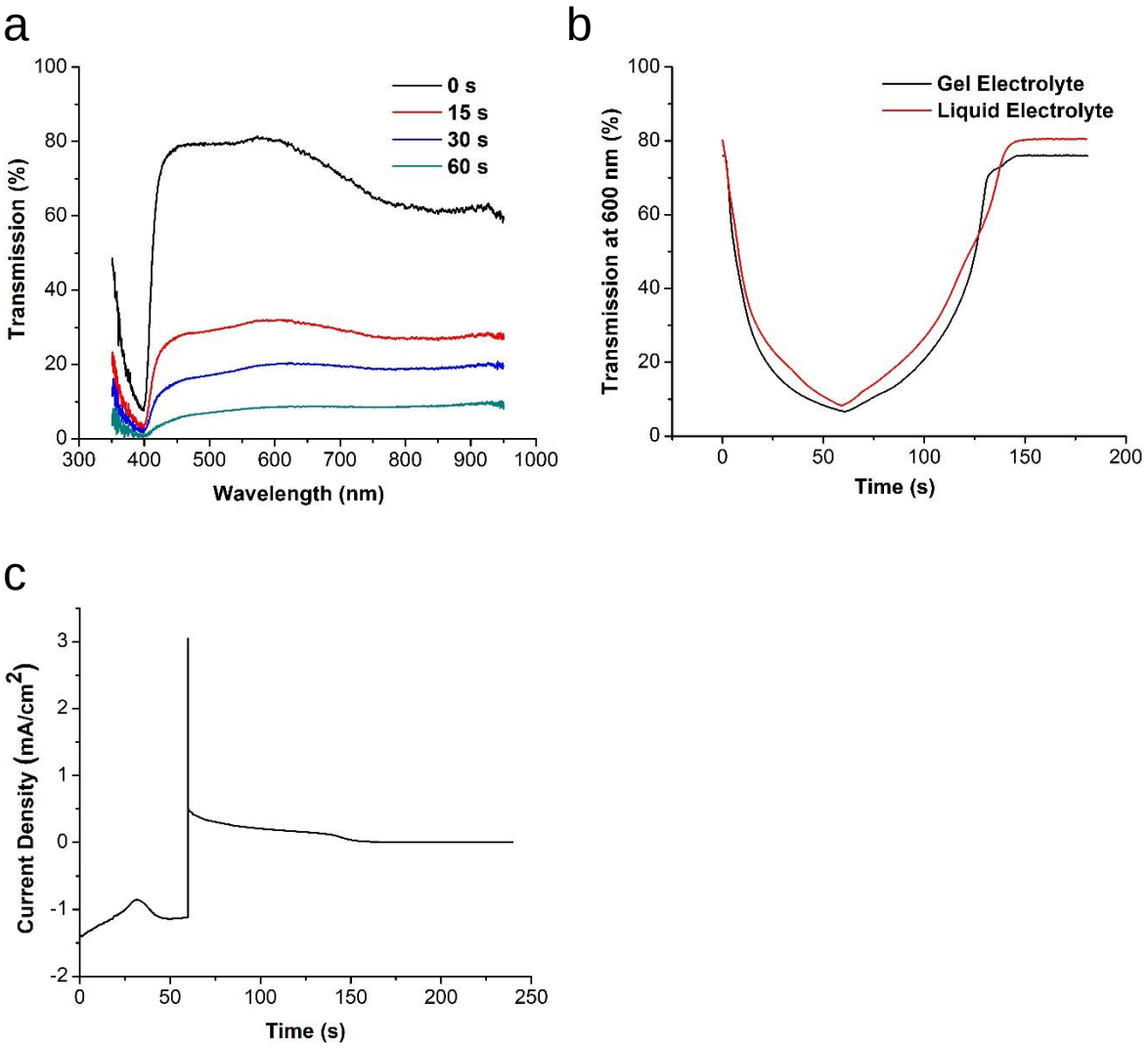
Supplementary Figure 4: Chronoamperometry of a 25 cm^2 dynamic window with a Pt-modified ITO on glass working electrode, a $LiNiO_x$ on ITO on glass counter electrode formed using electrodeposition, and a Cu-Bi gel electrolyte during 60 s of metal electrodeposition at -2.5 V and 120 s of metal stripping at 0 V.



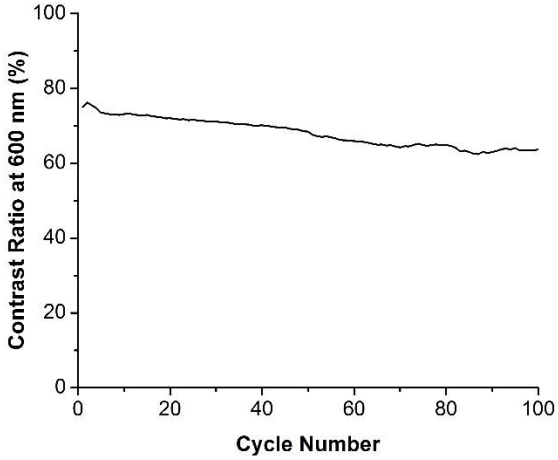
Supplementary Figure 5: Transmission at 600 nm of a 25 cm^2 hybrid dynamic window that was darkened to an intermediate transmission state using 15 s (black), 30 s (red), 45 s (blue), or 60 s (pink) of metal electrodeposition at -2.5 V followed by 300 s at -0.55 V to keep the window in its intermediate state (a). Representative chronoamperometry at -0.55 V (b). By calculating the average current density from the chronoamperometry, the average power density is calculated to be 2.7 W m^{-2} to keep the window in any dark state.



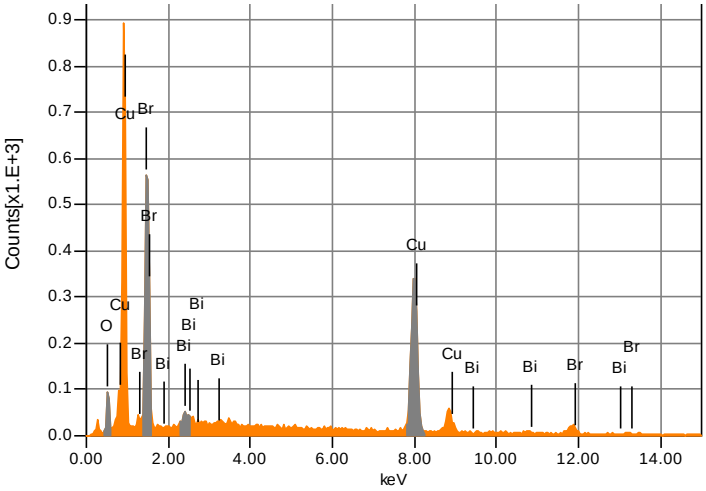
Supplementary Figure 6: Transmission (a, b), reflection (c, d), and absorption (e, f) of a 25 cm^2 dynamic window with a Pt-modified ITO on glass working electrode, a $LiNiO_x$ on ITO on glass counter electrode, and a Cu-Bi gel electrolyte as a function of wavelength after 0 s (black) and 60 s (red) of window tinting at -2.5 V.



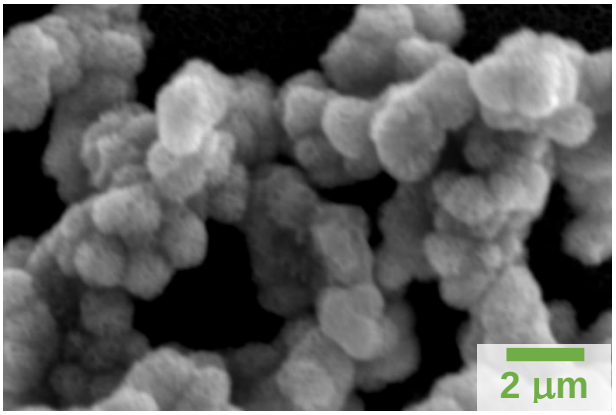
Supplementary Figure 7: Transmission of a 25 cm^2 dynamic window with a Pt-modified ITO on glass working electrode, a $LiNiO_x$ on ITO on glass counter electrode formed using electrodeposition, and a Cu-Bi liquid electrolyte as a function of wavelength after 0 s (black), 15 s (red), 30 s (blue), and 60 s (teal) of window tinting at -2.5 V (a). Transmission of the same window at 600 nm during 60 s of metal electrodeposition at -2.5 V and 120 s of metal stripping at 0 V (b). Chronoamperometry of the window during switching (c).



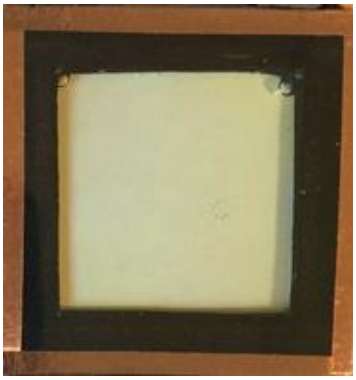
Supplementary Figure 8: Contrast ratio of dynamic window with a Pt-modified ITO on glass working electrode and a $LiNiO_x$ on ITO on glass counter electrode over the course of 100 cycles.



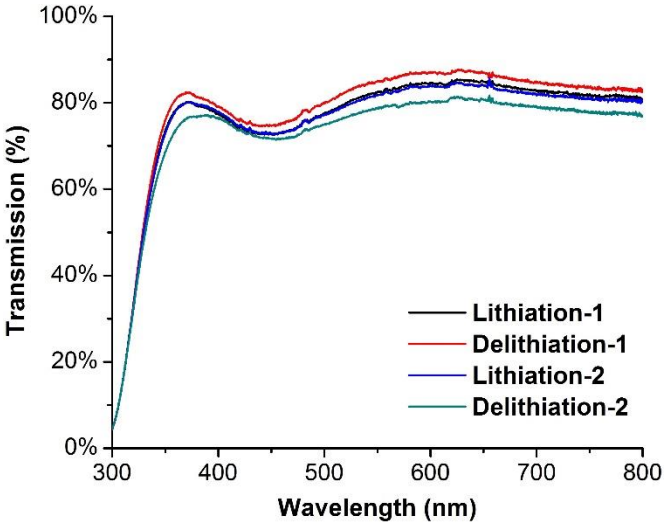
Supplementary Figure 9: EDX spectrum of a NiO on ITO on glass counter electrode after device cycling. The presence of Bi and Cu in the spectrum indicates that metal deposits on the counter electrode, giving rise to the visible greying of the electrode that lowers the maximum transmission of the device during cycling. Br is also present due to LiBr in the electrolyte.



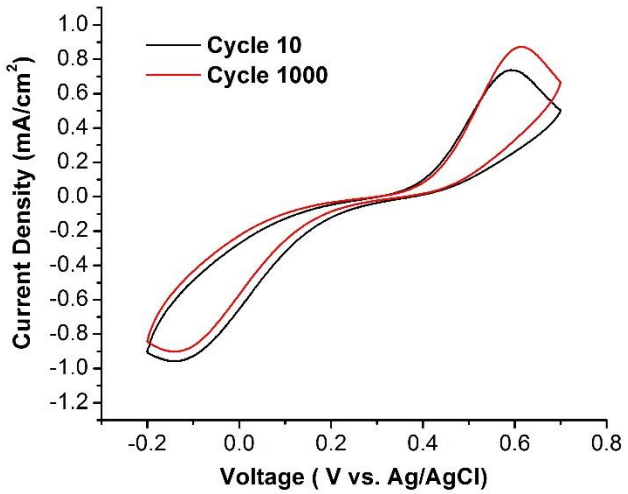
Supplementary Figure 10: SEM images of BTD on NiO on ITO on glass.



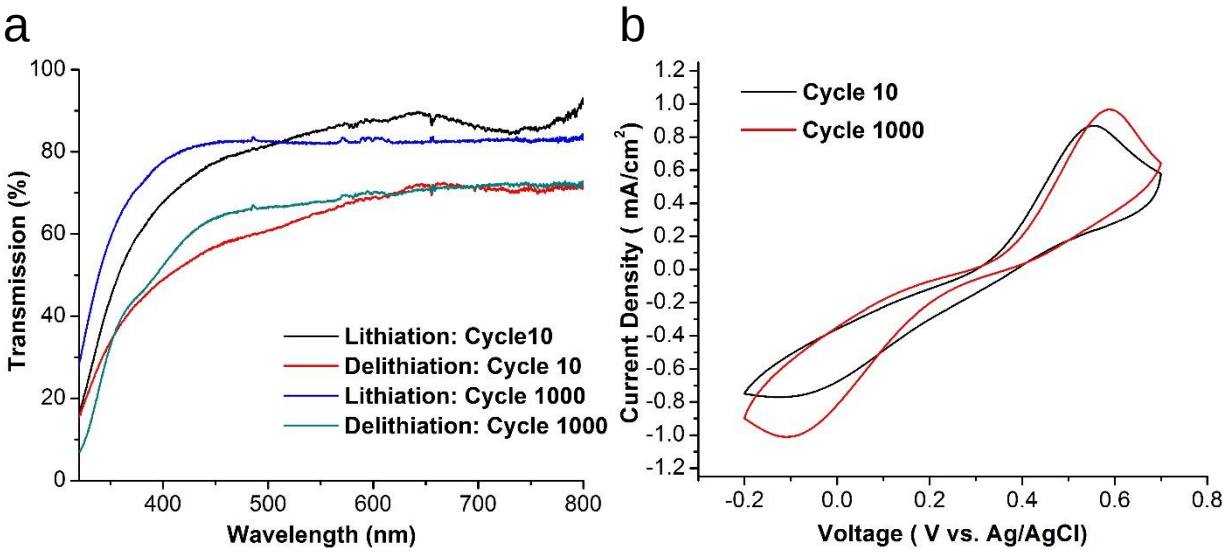
Supplementary Figure 11: Photograph of a 25 cm^2 dynamic window utilizing an unmodified ITO counter electrode. Following 10 complete cycles of -2.5V for 30 s and 0V for 60 s, the device turns yellow due to the formation of Br_3^- in the electrolyte.



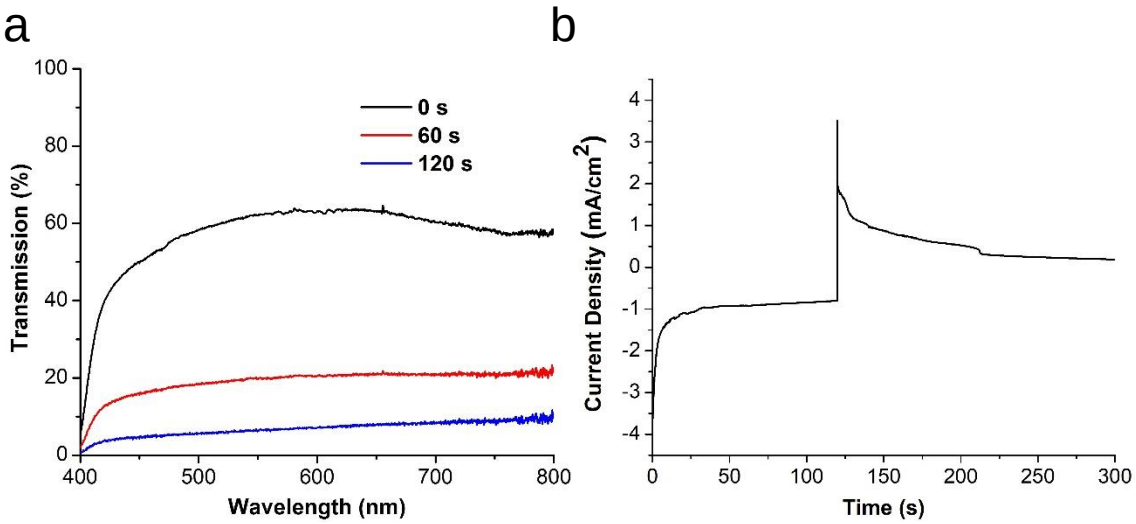
Supplementary Figure 12: Transmission of a ITO on glass working electrode in a three-electrode cell using a 1 M LiBr electrolyte. A voltage of -0.01 V was applied for 180 s to lithiate the electrode and 0.67 V was applied for 60 s to delithiate the electrode.



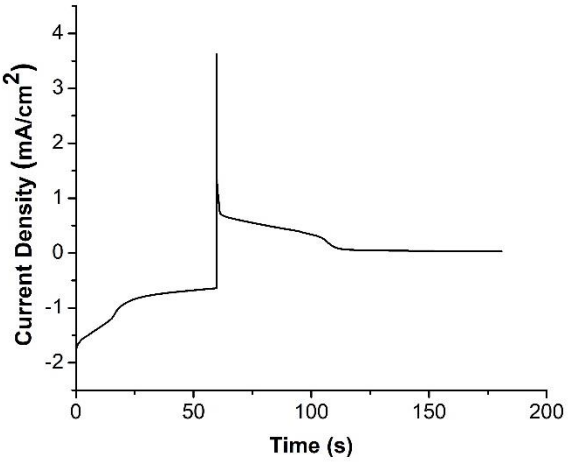
Supplementary Figure 13: Cyclic voltammograms of ITO on glass electrodes coated with NiO in the aqueous Cu-Bi electrolyte at 50 mV/s.



Supplementary Figure 14: Transmission of a BTD-coated NiO film on an ITO on glass working electrode in a three-electrode cell using a 1 M LiBr electrolyte (a). A voltage of -0.01 V was applied for 180 s to lithiate the electrode and 0.67 V was applied for 60 s to delithiate the electrode. Cyclic voltammograms of the same electrode in the aqueous Cu-Bi electrolyte at 50 mV/s (b).



Supplementary Figure 15: Transmission of a 25 cm^2 dynamic window with a Pt-modified ITO on PET working electrode, a $LiNiO_x$ on ITO on PET counter electrode formed using chemical bath deposition, and a Cu-Bi liquid electrolyte as a function of wavelength after 0 s (black), 60 s (red), and 120 s (blue) of window tinting at -2.5 V (a). Chronoamperometry (b) of the same window during 120 s of metal electrodeposition at -2.5 V and 180 s of metal stripping at 0 V.



Supplementary Figure 16: Chronoamperometry of a 100 cm^2 dynamic window using a voltage of -2.5 V for 60 s and 0 V for 120 s.