Mechanistic Insights into the Coloration, Evolution and Degradation of NiO_x Electrochromic Anodes

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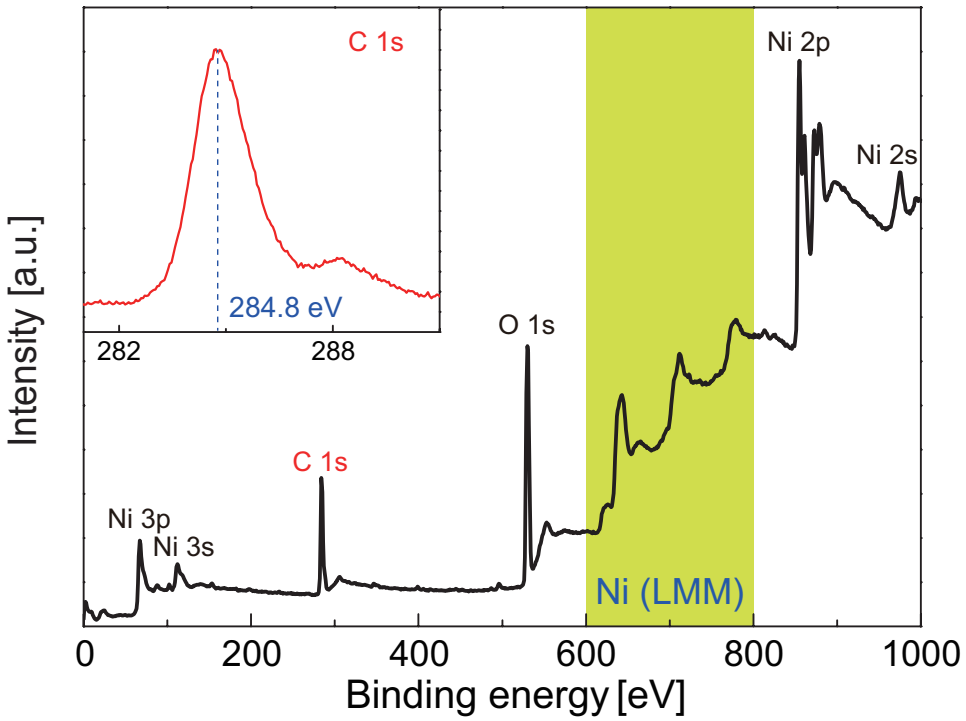
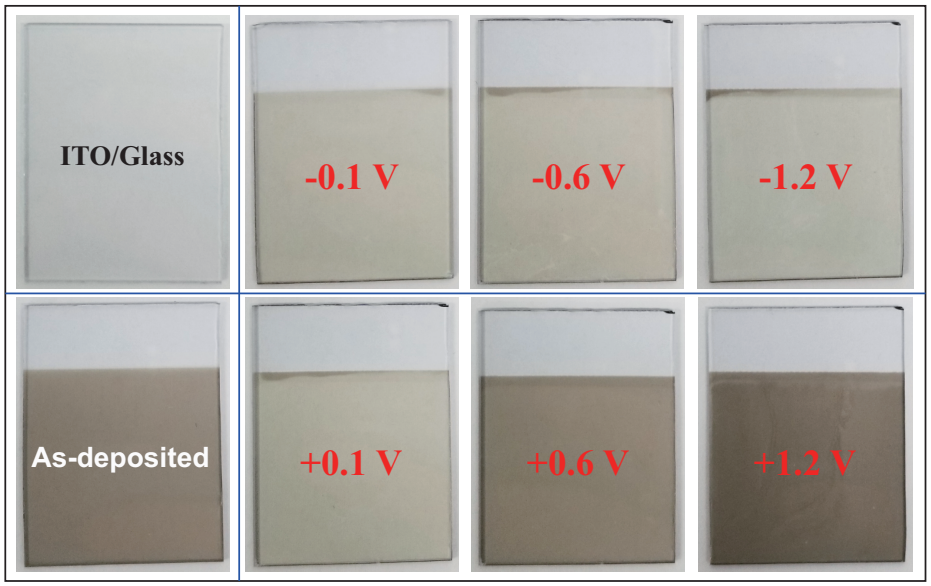
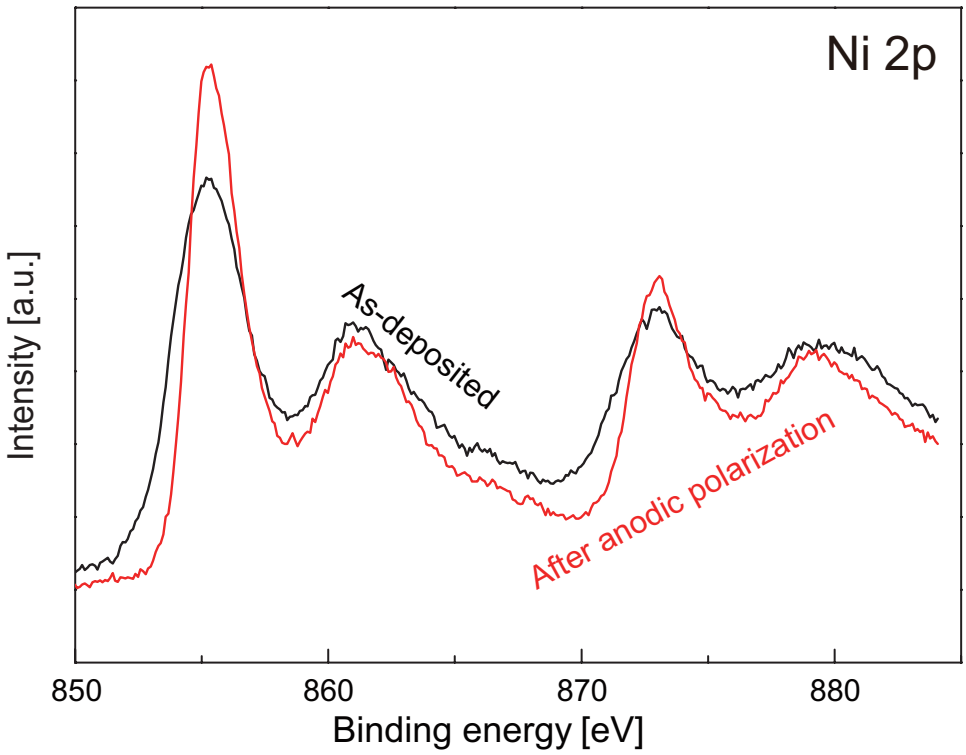


S 1: Survey-wide scan XPS spectrum of as-deposited NiO_x film surface.



S 2: Photographs of ITO/Glass substrate and NiO_x film in different states.



S 3: Ni 2p XPS spectra of NiO_x film surfaces in as-deposited state and after anodic polarization. The observed shift of peaks towards higher binding energy indicates the generation of new high valence Ni^{3+}/Ni^{4+} ions. The anodic polarization was implemented through chronoamperometry in PC – $LiClO_4$ by using a potential value of 1.5 V vs Ag/AgCl for 60 sec.

Chronoamperometry parameters used for Fig. 2:

Init E=-0.1 V· · ·-1.2 V; Low E=-0.1 V· · ·-1.2 V; High E=0.1 V· · ·1.2 V; Step=12; Pulse Width=6 sec.

Linear Sweep Voltammetry parameters used for Fig. 3:

Init E=-0.3 V; Final E=1.5 V; Scan rate=0.1 V/sec.

Cyclic Voltammetry parameters used for Fig. 3:

Init E=-0.5 V; High E=1.5 V; Low E=-0.5 V; Scan rate=0.1 V/sec; Step=4.

Cyclic Voltammetry parameters used for Fig. 4:

Init E=-0.7 V; High E=1.5 V; Low E=-0.7 V; Scan rate=0.3 V/sec; Step=30.

Linear Sweep Voltammetry parameters used for Fig. 4:

Init E=0 V; Final E=1.5 V; Scan rate=0.01 V/sec

Init E=0 V; Final E=-1 V; Scan rate=0.01 V/sec.

Cyclic Voltammetry parameters used for Fig. 5:

Init E=-0.3 V; High E=1.5 V; Low E=-0.7 V; Scan rate=0.1 V/sec; Step=2000.