Electronic Supplementary Material (ESI) for Chemical Communications

Electric supplementary information (ESI)

Electroless Galvanic Incs on Inorganic WO_3/Al Boards

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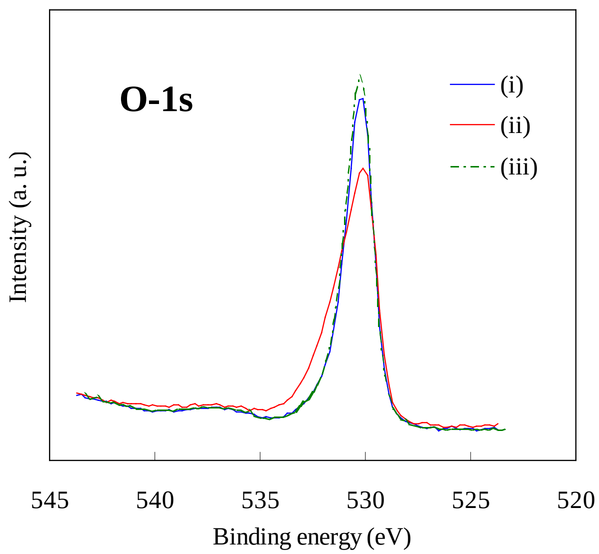


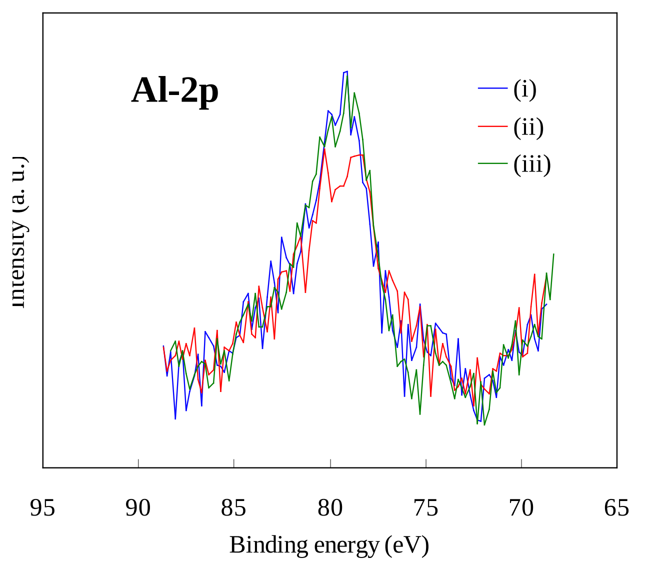


Fig. S1 XPS for O-1s and Al-2p orbitals. (i) before treatment, (ii) after dipping in an aqueous HCl solution with a pH of 3.0 for 5 min, (iii) after exposure to air at 120 °C for 30 min. .

in acid (pH: 3.0) **in neutral (pH: 6.8)** **in alkali (pH: 9.2)**

Fig. S2 Photographs of WO_3/Al samples after dipping in aqueous solutions with varying pH values.

Although WO_3/Al also turns blue in an alkali solution, the color change is not as homogeneous as that after the acid treatment. Moreover, the color change was insignificant after dipping WO_3/Al into a neutral aqueous solution.

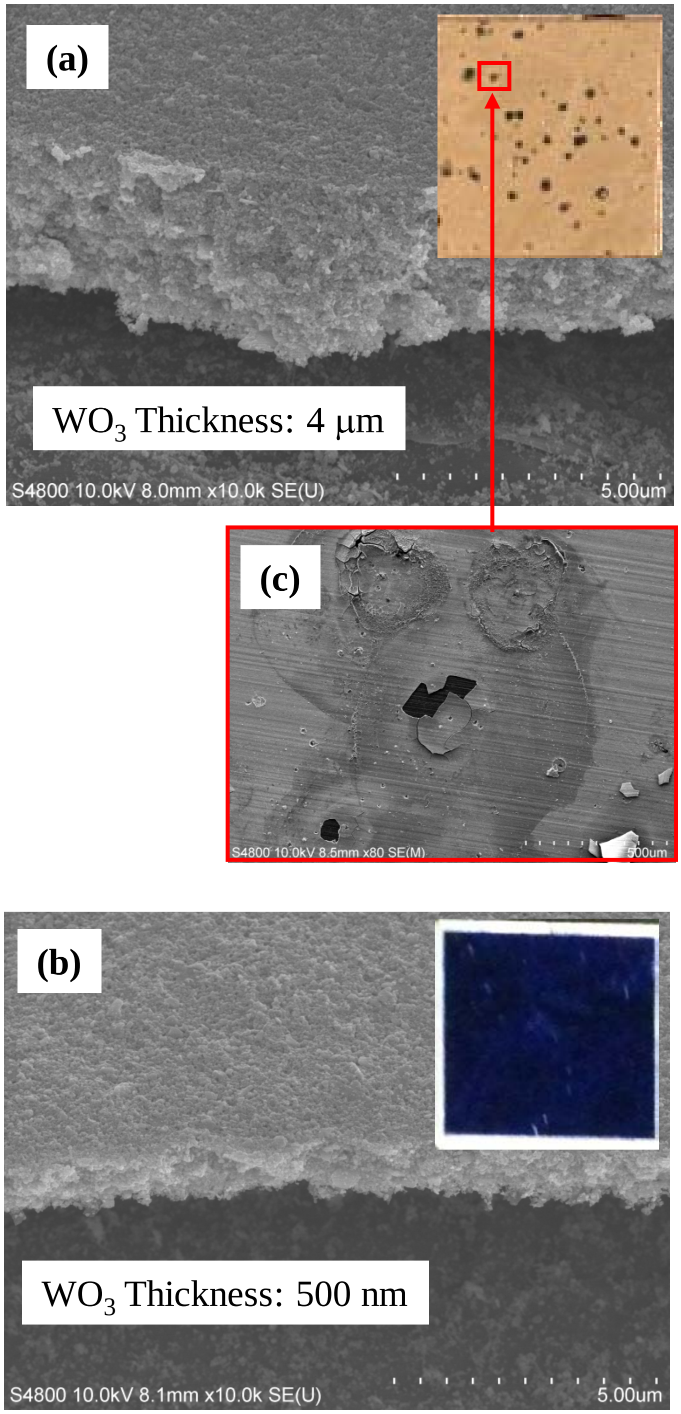
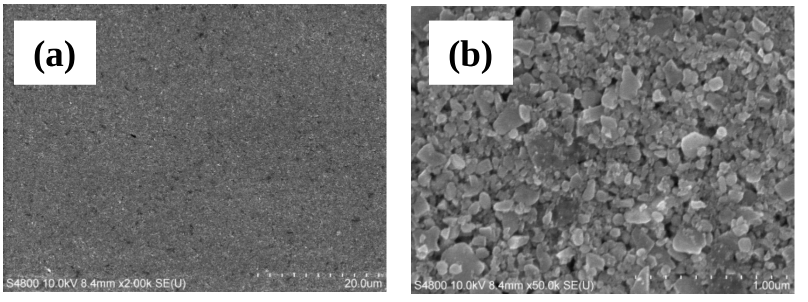
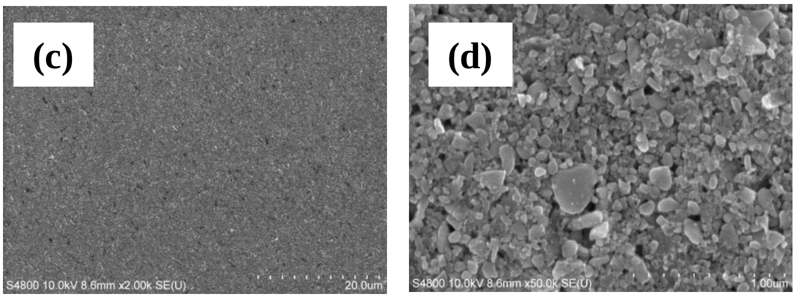


Fig. S3 SEM images for WO_3/Al samples with WO_3 thicknesses of 4 μm (a) and 500 nm (b). Insets in (a) and (b) are photographs of WO_3/Al. (c) SEM image at the blue spot in Fig. *S3* (a).

Blue color appears only around the pinholes of WO_3 film with a thickness of 4 μm.



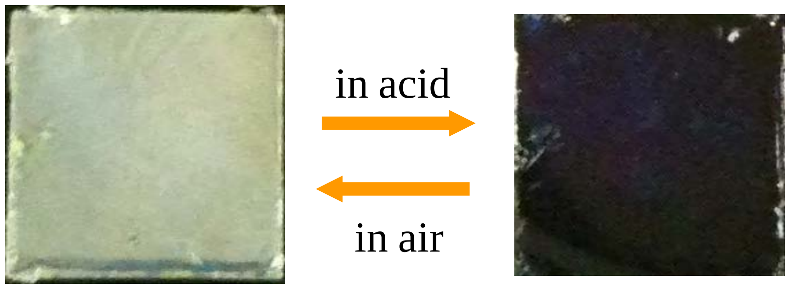
Initial WO_3/Al



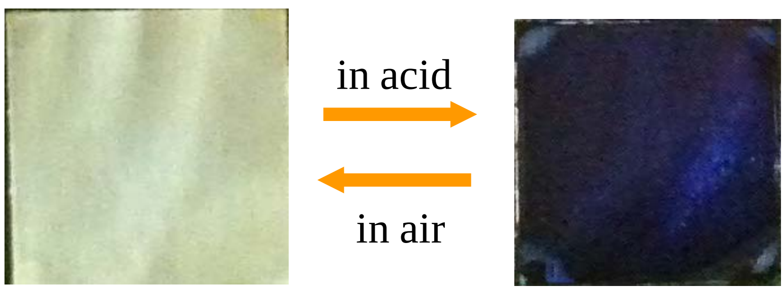
After 5 times repeated coloration and decoloration

Fig. S4 SEM images for WO_3/Al samples. (a) and (b) are before coloration (initial state), (c) and (d) are after repeating the coloration and decoloration processes five time.

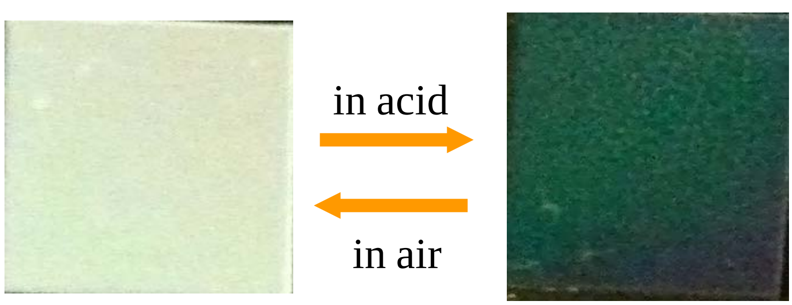
Morphology of WO_3 does not change after repeating these processes.



(a) Polycrystalline WO_3 coated on Al foil



(b) Polycrystalline WO_3 coated on Al coated glass substrate (Al was deposited on glass substrate by sputtering)



(c) Amorphous WO_3 coated on Al plate by pulsed layer deposition method.

Fig. S5 Photographs of various WO_3/Al structures. We confirmed that chromic devices can also be constructed by sputtering an Al foil or Al-coated glass substrate. Additionally, we found that similar to WO_3 crystals, amorphous WO_3 also exhibits an efficient color change.