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Self organized nano-tubes of TiO2-MoO3 with enhanced electrochromic properties

## Electronic supplimentry information (ESI) †



**Fig. S1**. SEM (a) top and (b) cross-sectional view of self organized TiO<sub>2</sub>-MoO<sub>3</sub> composite oxide nano-structure.



**Fig. S2**. TEM-SAD patterns of TiO<sub>2</sub>-MoO<sub>3</sub> composite oxide nano-tubes (a) before and (b) after annealing at 550 °C in air showing the crystallization of the as prepared amorphous nano-tubes into polycrystaline structure after annealing. In (b) A: anatase TiO<sub>2</sub>, R: rutile TiO<sub>2</sub> and M:  $\alpha$ -MoO<sub>3</sub>. (c) TEM image of the selected area of the annealed nano-tube sample.

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Fig. S3. XPS spectra of (a) O1s, (b)Ti2p and (c) Mo3d in TiO<sub>2</sub>-MoO<sub>3</sub> composite oxide nanotubes. Spectra of O1s and Ti2p in TiO<sub>2</sub> nano-tubes have also been shown in (a) and (b) for comparaison.



Fig. S4 EDX spectrum of TiO<sub>2</sub>-MoO<sub>3</sub> composite oxide nano-tubes.



Fig. S5. Normalized reflectivity ( $\Delta R$ ) from the surface of amorphos TiO<sub>2</sub>-MoO<sub>3</sub> composite oxide nano-tube with respect to the number of anonic and cathodic cycle between +1.0V to -0.7V in 0.1M HClO<sub>4</sub> aquous solution.