Supporting Information

Electrochromic $W_{1-x-y}Ti_xMo_yO_3$ thin films made by sputter deposition: Large optical modulation, good cycling durability, and approximate color neutrality

M.A. Arvizu*, G.A. Niklasson, C.G. Granqvist

Department of Engineering Sciences, The Ångström Laboratory, Uppsala University, P.O. Box 534, SE-751 21 Uppsala, Sweden

Keywords: Electrochromism, W oxide, Ti oxide, Mo oxide, durability, color, smart window

*Corresponding author: marvizu@fis.cinvestav.com.mx

Table S1. Compositional data for ~300-nm-thick films of $W_{1-x-y}Ti_xMo_yO_z$ prepared by co-sputtering from W–Ti targets with the shown compositions at a power of 225 W and from a Mo target at a power P_{Mo}.

W/Ti ratio [wt.%]	P_{Mo} [W]	x	y	z
95/5	75	0.12	0.02	3.1
95/5	100	0.12	0.04	3.1
95/5	125	0.12	0.06	3.1
95/5	150	0.11	0.07	3.1
95/5	175	0.11	0.09	3.1
95/5	200	0.12	0.11	3.1
95/5	225	0.11	0.16	3.1
95/5	250	0.10	0.20	3.1
90/10	75	0.19	0.03	3.1
90/10	100	0.20	0.04	3.1
90/10	125	0.19	0.06	3.1
90/10	150	0.19	0.08	3.0
90/10	175	0.18	0.12	3.0
90/10	200	0.17	0.14	3.1
90/10	225	0.18	0.17	3.0
90/10	250	0.17	0.22	3.1

Table S2. Chromaticity coordinates (**x**, **y**) for ~300-nm-thick films of $W_{1-x-y}Ti_xMo_yO_3$ with the shown compositions, corresponding to the data in Figure 7.

Sample	**x**	**y**
WO_3	0.193	0.173
MoO_3	0.229	0.225
$W_{0.86}Ti_{0.12}Mo_{0.02}$	0.198	0.182
$W_{0.84}Ti_{0.12}Mo_{0.04}$	0.208	0.193
$W_{0.82}Ti_{0.12}Mo_{0.06}$	0.224	0.220
$W_{0.70}Ti_{0.10}Mo_{0.20}$	0.241	0.238
$W_{0.78}Ti_{0.19}Mo_{0.03}$	0.220	0.220
$W_{0.61}Ti_{0.17}Mo_{0.22}$	0.234	0.233

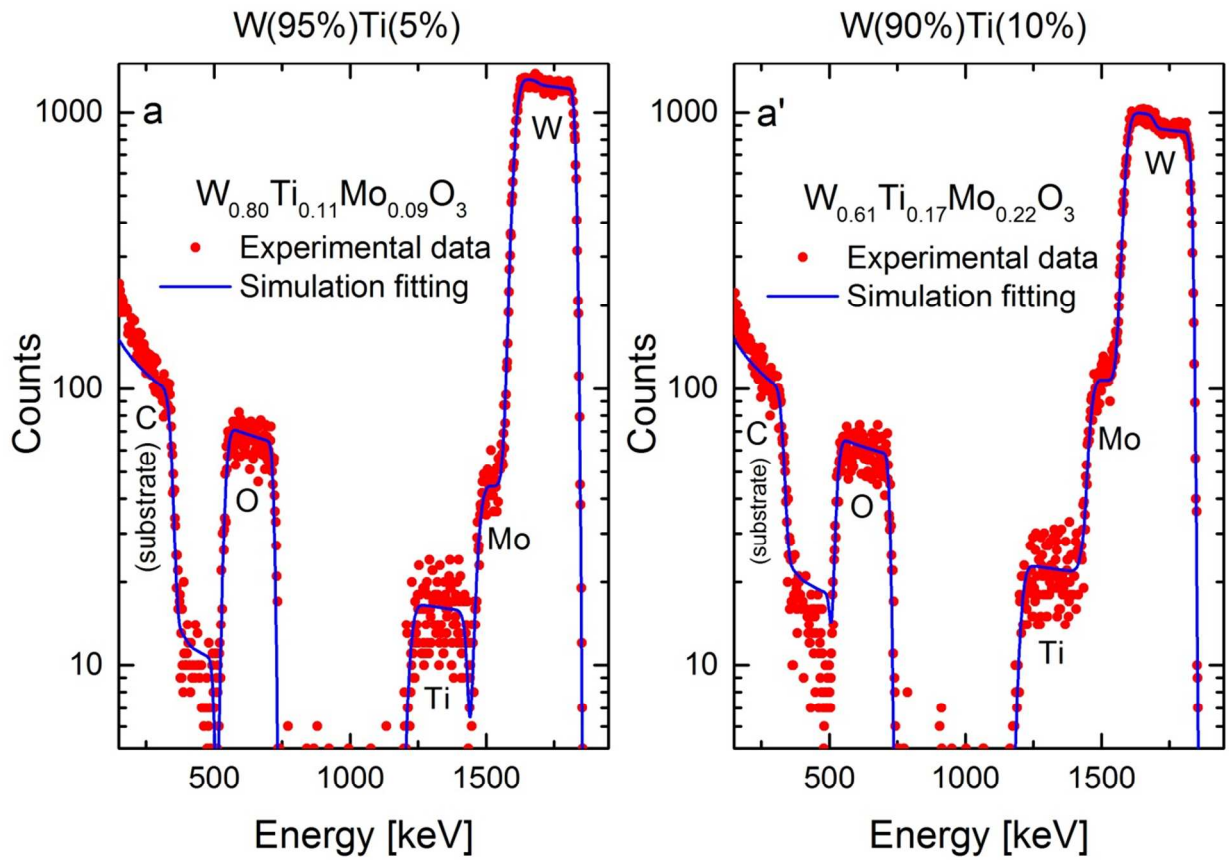

Figure S1. RBS spectra, showing number of counts per energy for selected ~300-nm-thick films of $W_{1-x-y}Ti_xMo_yO_3$ with the shown compositions. Data in panels a and a' refer to films obtained by sputter deposition using W–Ti targets of the stated compositions. Symbols denote experimental data and curves were simulated from the SIMNRA program. The various features were assigned to the indicated elements.