Supporting Information:

SYNTHESIS OF BIRNESSITE – STRUCTURE LAYERS AT THE SOLUTION-AIR INTERFACE AND FORMATION OF MICROTUBULES FROM THEM

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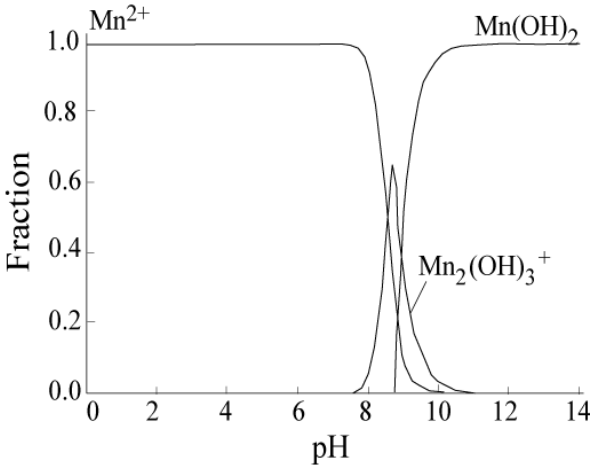

Figure S1. Diagram of states of manganese ions in $Mn(CH_3COO)_2$ solution with no admixture of CH_3COONa.

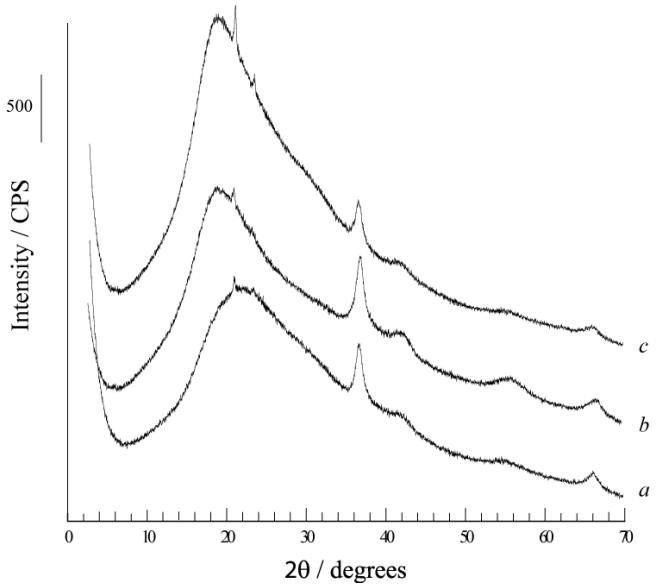

Figure S2. X-ray diffraction pattern of $H_xMnO_2 \cdot nH_2O$ nanosheets synthesized from *(a)* $Mn(NO_3)_2$; *(b)* $MnSO_4$; *(c)* $MnCl_2$ solutions.

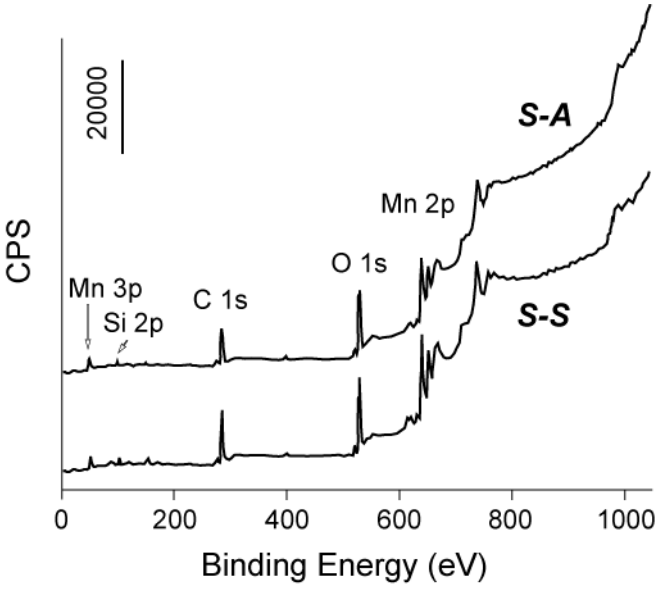

Figure S3. XPS spectrum of $H_xMnO_2 \cdot nH_2O$ sample. S-A: Solid – Air interface side, S-S: Solid – Solution interface side.

Table S1. EPMA analysis for the $H_xMnO_2 \cdot nH_2O$ tubule on Si surface.

Element	Weight %	Atomic %
C K	6.41	12.95
O K	41.79	63.33
Si K	2.04	1.76
Mn K	49.76	21.96
Totals	100.00	

a *b*

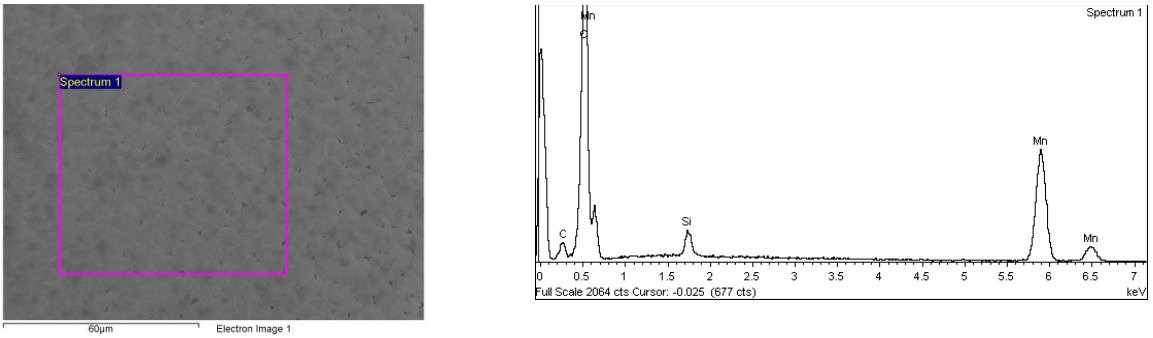

Figure S4. EPMA analysis for the $H_xMnO_2 \cdot nH_2O$ sample (*a*) SEM image of the sample (*b*) EDX spectrum of the sample.

Table S2. AAS analysis for the $H_xMnO_2 \cdot nH_2O$ sample.

	Content, mg/l	Abs	Act. conc.	% RSD	SD
Standard 1-av	0.1000	0.0828		1.20	0.0010
Standard 2-av	0.5000	0.4880		0.28	0.0013
Standard 3-av	0.5000	0.4528		2.20	0.0100
Standard 4-av	1.0000	0.9598		0.39	0.0037
Test solution-av		0.0324	0.0493 ppm	10.69	0.0037

C(Na) = 0.0493 ± 0.0098 mg/l

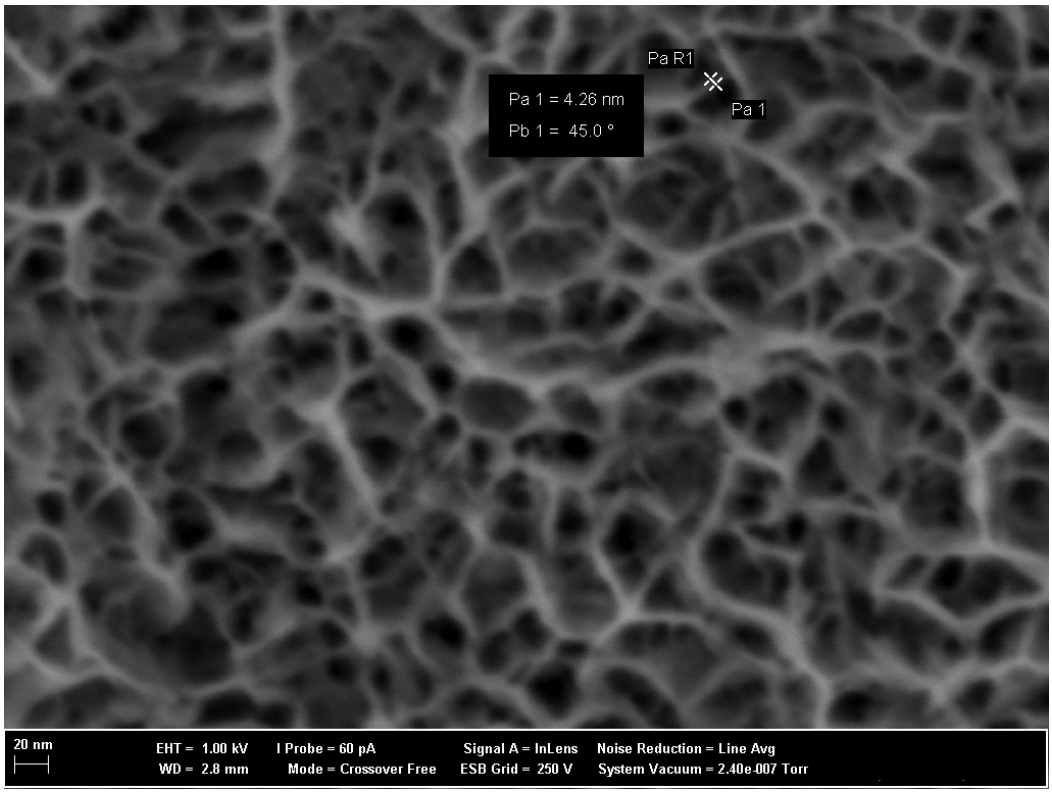

Figure S5. SEM image of the inner side of $H_xMnO_2 \cdot nH_2O$ tubule.