

Supporting Information for

Atomic Layer Deposited Tantalum Oxide to Anchor Pt/C for Highly Stable Catalyst in PEMFCs

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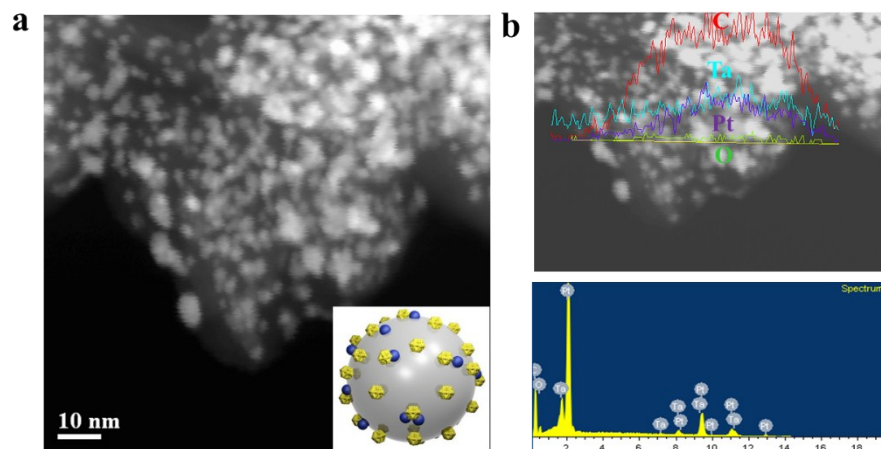


Figure S1. (a) STEM image and (b) STEM line scan spectra of 15ALD-TaO_x-Pt/C catalyst.

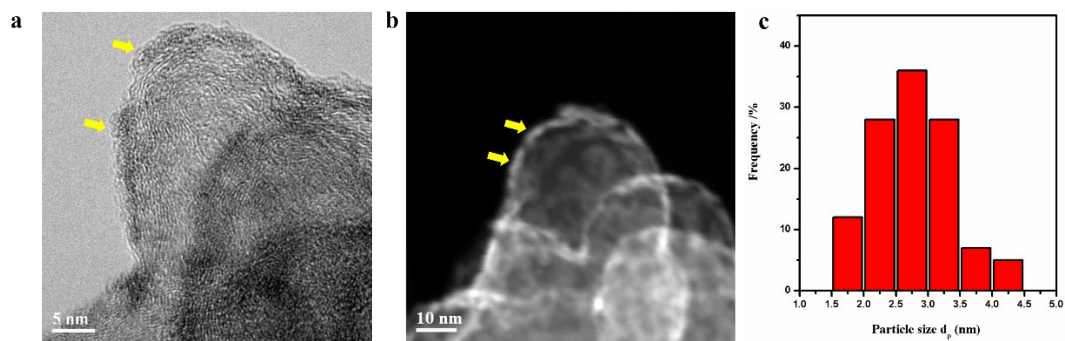


Figure S2. (a) HRTEM and (b) STEM images of 35ALD-TaOx on CB without Pt NPs. (c) The particle size distribution histogram of TaOx in 35 ALD-TaOx-CB sample.

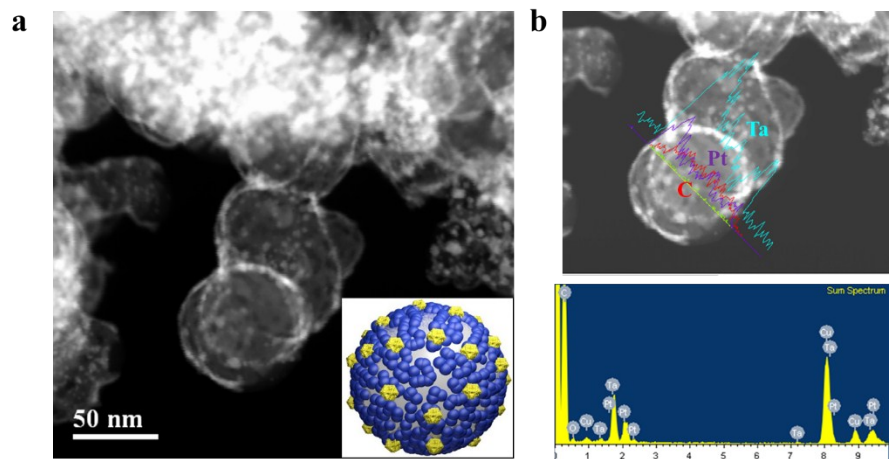


Figure S3. (a) STEM image and (b) STEM line scan spectra of 50ALD-TaOx-Pt/C catalyst.

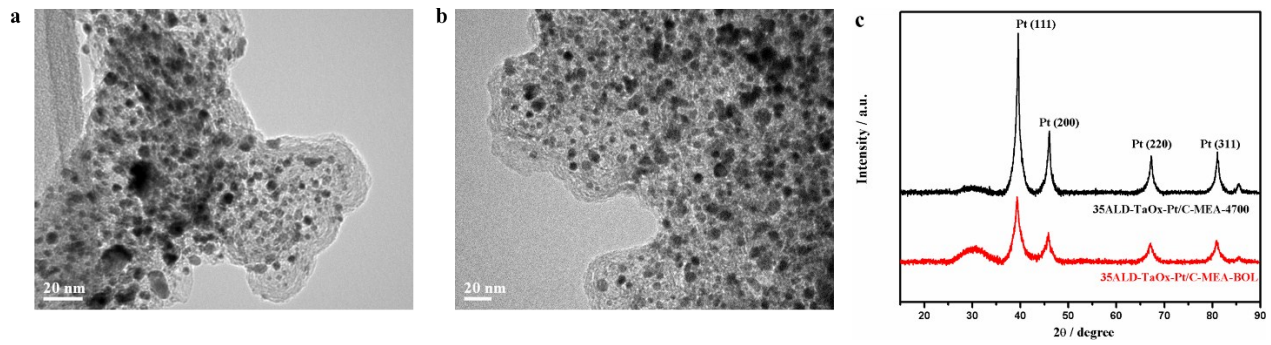


Figure S4. HRTEM images (a, b) and XRD patterns (c) of 35ALD-TaOx-Pt/C-MEA cathode before (a) and after (b) 4700 cycles aging test.

Table S1. The ECSA values and Mass activity of different catalyst during the ADT cycling between 0.6 V-1.0 V.

Catalyst	ECSA ($\text{m}^2 \cdot \text{g}^{-1} \text{Pt}$)			Mass activity ($\text{A} \cdot \text{mg}^{-1} \text{Pt}$) @0.9 V	
	BOL	ADT-1000	ADT-10,000	BOL	ADT-10000
15ALD-TaOx-Pt/C	60.0	58.8	52.8	0.237	0.200
35ALD-TaOx-Pt/C	60.6	64.7	62.7	0.246	0.227
50ALD-TaOx-Pt/C	12.9	39.8	48.3	0.148	0.173
Pt/C	68.8	60.8	48.4	0.262	0.197

Table S2. The ECSA values and Mass activity of different catalyst during the ADT cycling between 1.0 V-1.6 V.

Catalyst	ECSA ($\text{m}^2 \cdot \text{g}^{-1} \text{Pt}$)			Mass activity ($\text{A} \cdot \text{mg}^{-1} \text{Pt}$) @0.9 V	
	BOL	ADT-1000	ADT-6000	BOL	ADT-6000
15ALD-TaOx-Pt/C	61.0	68.3	43.6	0.237	0.146
35ALD-TaOx-Pt/C	59.8	74.5	49.5	0.246	0.180
50ALD-TaOx-Pt/C	15.7	30.8	13.4	0.148	0.070
Pt/C	66.4	54.5	34.1	0.262	0.145