Pt-Based Electrocatalyst Modified by CsH_2PO_4/SiP_2O_7 for Electrochemical Oxidation of NH_3 to H_2 in Solid Acid Electrolysis Cell

Jihoon Kim [1,†], Daehee Jang [1,†], Junil Choi [1], Junbeom Maeng [1], Hyun Ho Shin [1], Taiho Park [1] and Won Bae Kim [1,2,*]

[1] Department of Chemical Engineering, Pohang University of Science and Technology (POSTECH), 77 Cheongam-ro, Nam-gu, Pohang, Gyeongbuk 37673, Republic of Korea
[2] Graduate Institute of Ferrous & Energy Materials Technology, Pohang University of Science and Technology (POSTECH), 77 Cheongam-ro, Nam-gu, Pohang, Gyeongbuk 37673, Republic of Korea
* Correspondence: kimwb@postech.ac.kr; Tel.: 82-54-279-2397; Fax: 82-54-279-5528
† These authors contributed equally to this work.

Table S1. Electrochemical impedance parameters of Pt/C_CDP/SPO-x catalysts at open circuit voltage under 60 mL min^{-1} ammonia flow rate condition.

Catalyst	L_1 (H)	R_s (Ω)	R_1 (Ω)	R_2 (Ω)
Pt/C_CDP/SPO-3	104.0×10^{-9}	1.92	1.57	9.59
Pt/C_CDP/SPO-6	94.7×10^{-9}	1.84	0.58	9.36
Pt/C_CDP/SPO-9	96.8×10^{-9}	1.83	0.44	12.47

Table S2. Analyses of ammonia crossover during the electrochemical AOR in the SAEC for 60 min.

Volume of water trap	Concentration of NH_3 in water trap	NH_3 crossover	Reaction time	Inlet gas flow rate	NH_3 concentration of outlet flow
mL	μM	μmol	min	mL min^{-1}	ppm
15.0	5.6	0.083	60.0	30.0	0.96

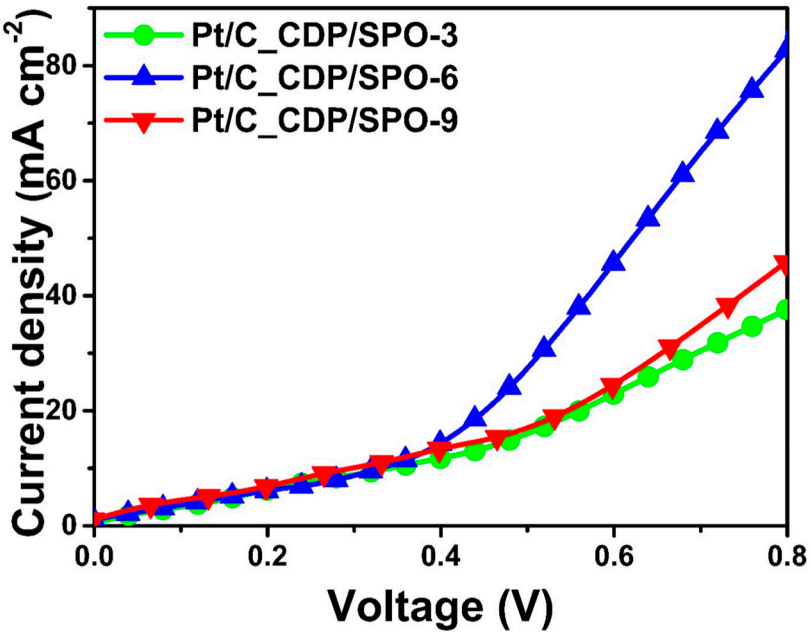

Figure S1 Linear sweep voltammetry (LSV) curves of Pt/C_CDP/SPO-x catalysts for AOR from 0 to 0.8 V at 10 mV s^{-1} scan rate.

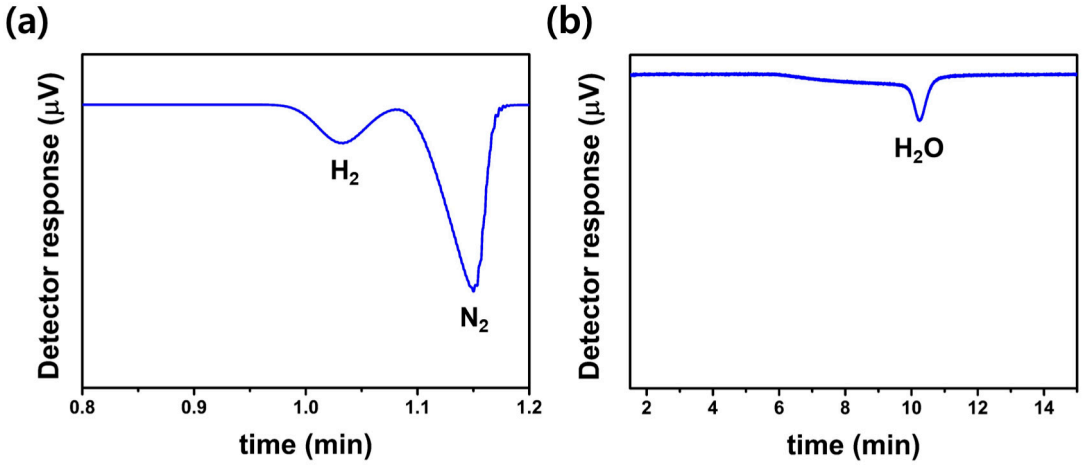

Figure S2 GC-TCD analysis of cathode outlet gas for the AOR using the Pt/C_CDP/SPO-6 catalyst at 0.8 V at a flow rate of NH_3 of 60 mL min^{-1} (a) from 0.8 to 1.2 min and (b) from 1.2 to 15 min.

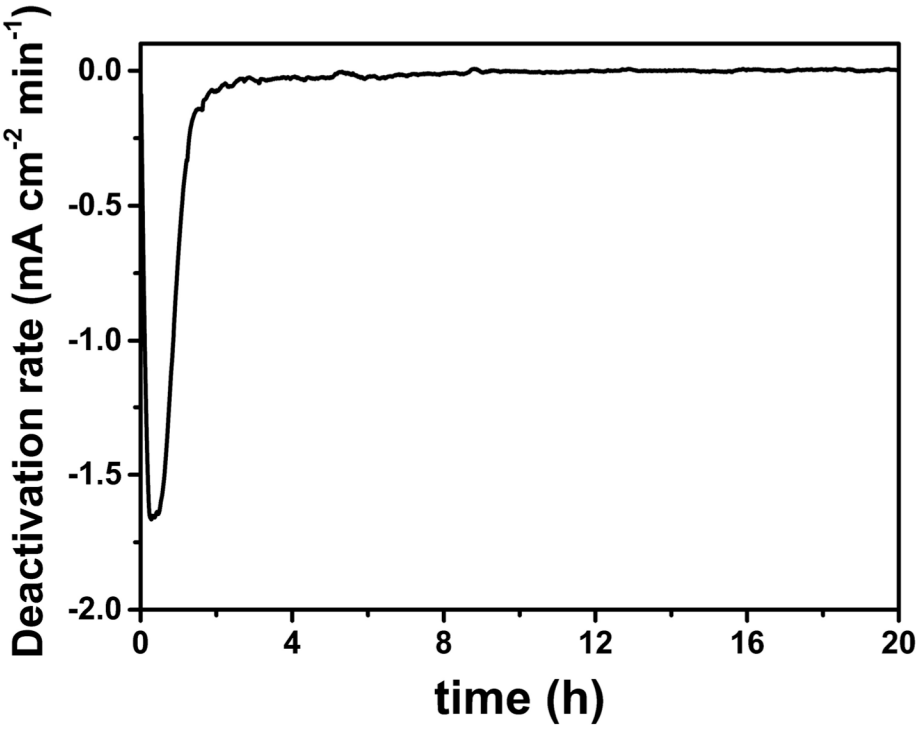

Figure S3 Deactivation rate of the Pt/C_CDP/SPO-6 catalyst at ammonia flow rate of 60 mL min^{-1} at 0.8 V for 20 h.

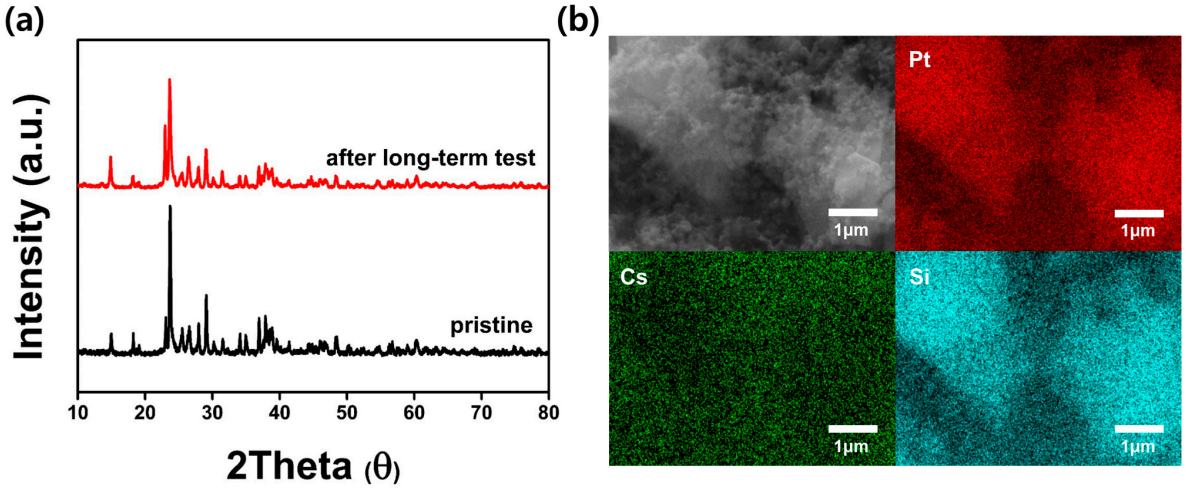

Figure S4 (a) XRD patterns of the pristine Pt/C_CDP/SPO-6 and after the long-term stability test. (b) SEM images and EDS elemental mapping of Pt, Cs and Si of Pt/C_CDP/SPO-6 after stability test.

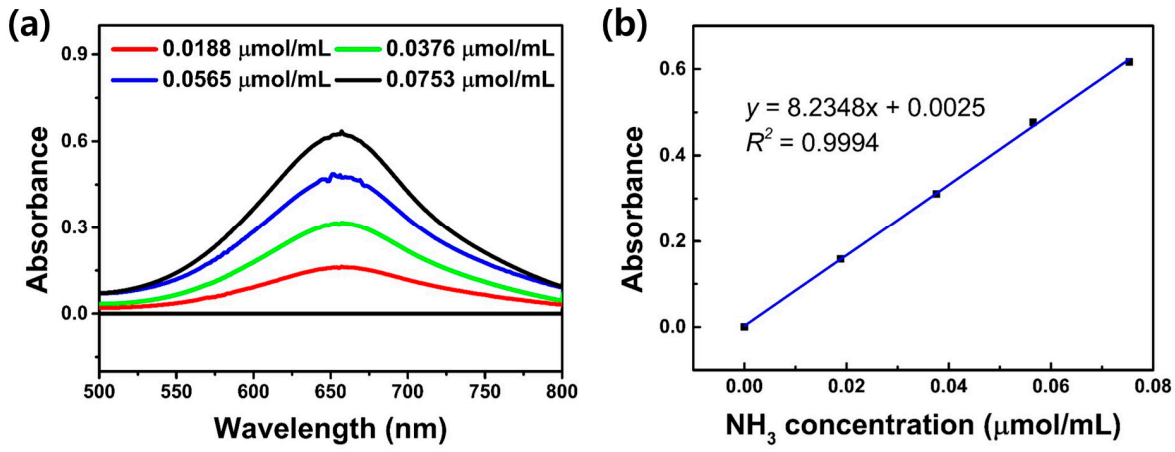

Figure S5 (a) UV-vis absorption spectra and (b) calibration curve for the indophenol blue method.

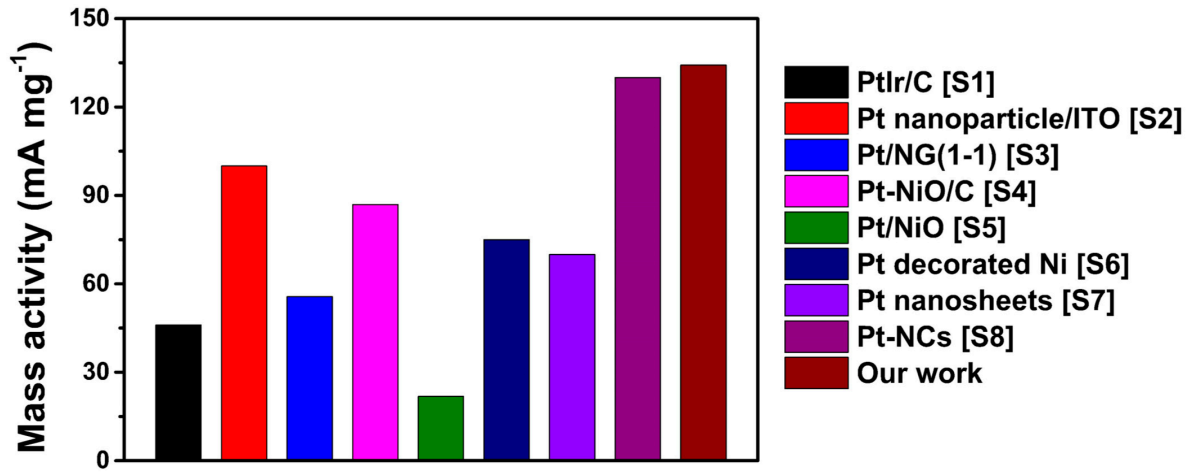

Figure S6 Comparison of mass activity for AOR over Pt-based catalysts with reported AOR literatures at low temperatures.

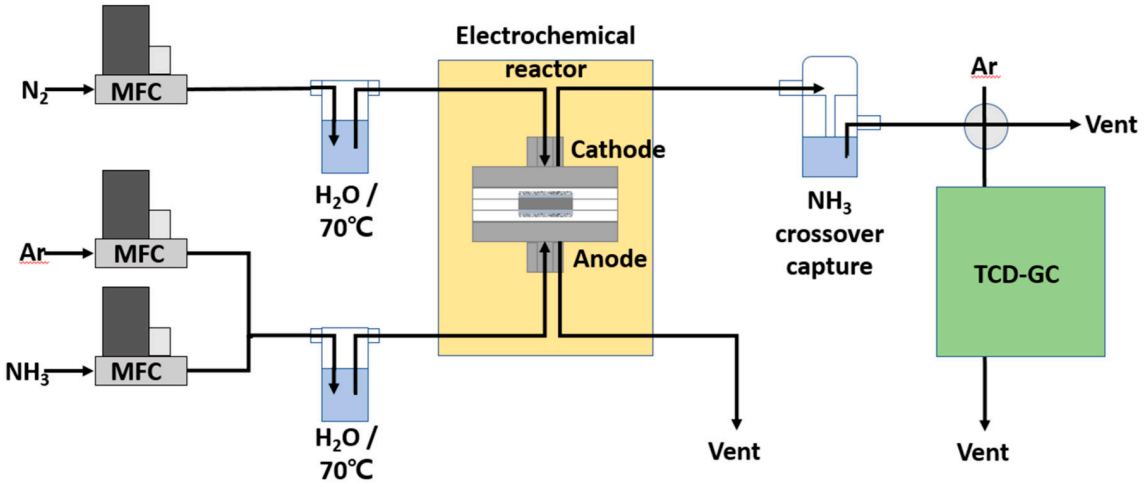

Figure S7 Schematic illustration of the overall AOR process with the SAEC system.

Reference for Figure S6.

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