

Supplementary Information

A simple preparation of a very high methanol tolerance cathode electrocatalyst for direct methanol fuel cell based on polymer-coated carbon nanotube/platinum

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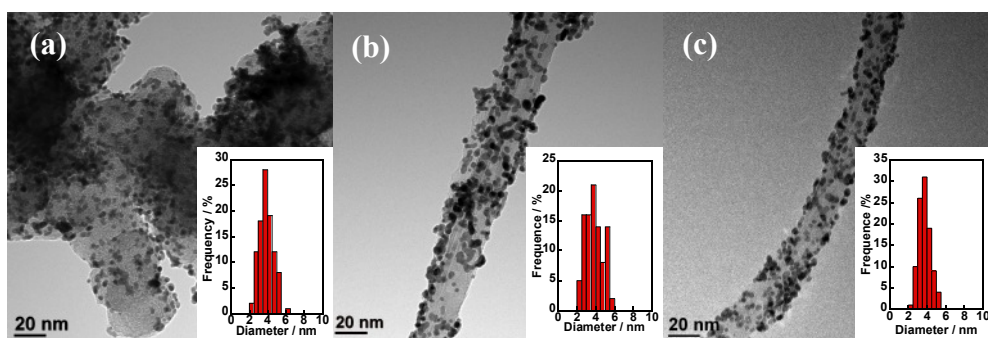


Figure S1| TEM images of the CB/Pt (a), MWNT/PyPBI/Pt (b) and MWNT/PyPBI/Pt/PVPA (c). Histograms of their particle size distribution (100 particles) are shown in the inset.

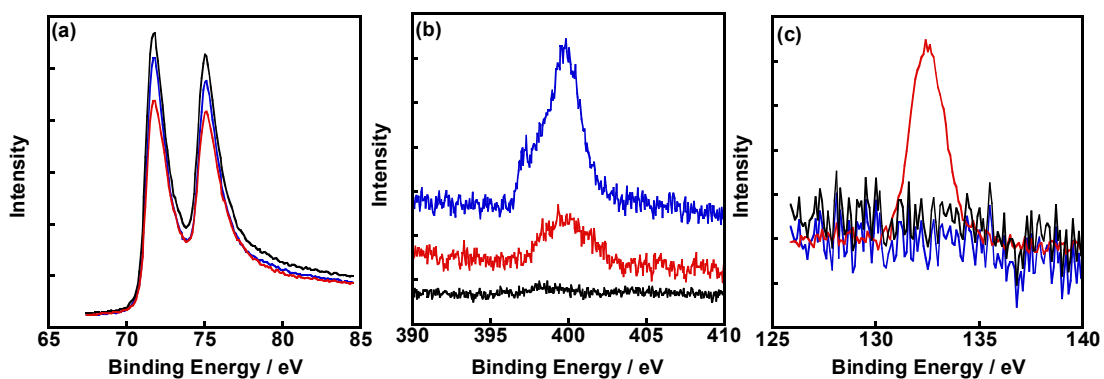


Figure S2 | XPS narrow scans in the regions of Pt_{4f} (a), N_{1s} (b) and P_{2p} (c) of the CB/Pt (black), MWNT/PyPBI/Pt (blue) and MWNT/PyPBI/Pt/PVPA (red).

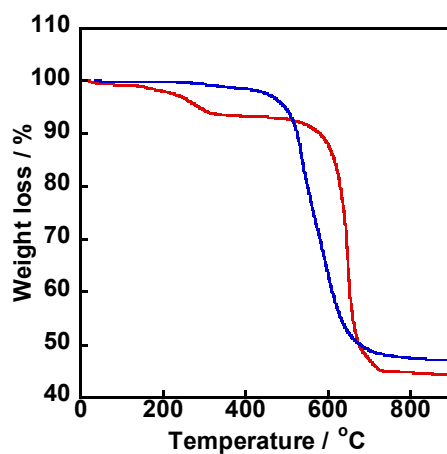


Figure S3 | TGA curves of the MWNT/PyPBI/Pt (blue) and MWNT/PyPBI/Pt/PVPA (red).

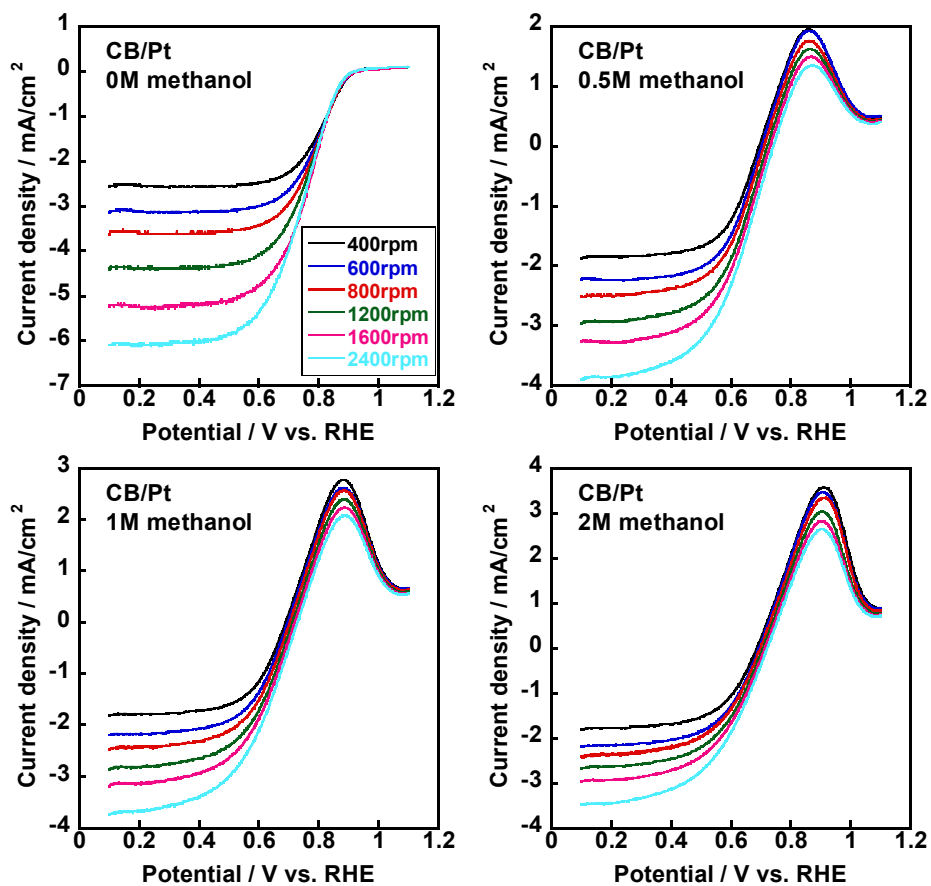


Figure S4| Rotating disc current density of the CB/Pt in O₂-saturated 0.1M HClO₄ solutions containing a specified concentration of methanol at 25 °C.

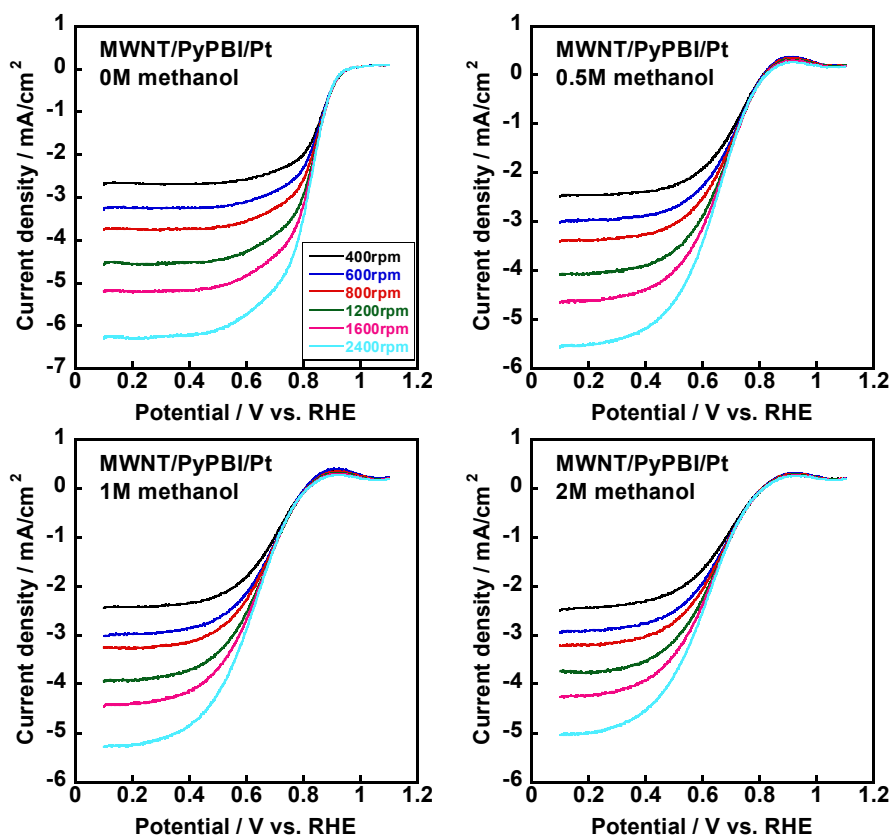


Figure S5] Rotating disc current density of the MWNT/PyPBI/Pt in O₂-saturated 0.1M HClO₄ solutions in the presence of specified concentration of methanol at 25 °C.

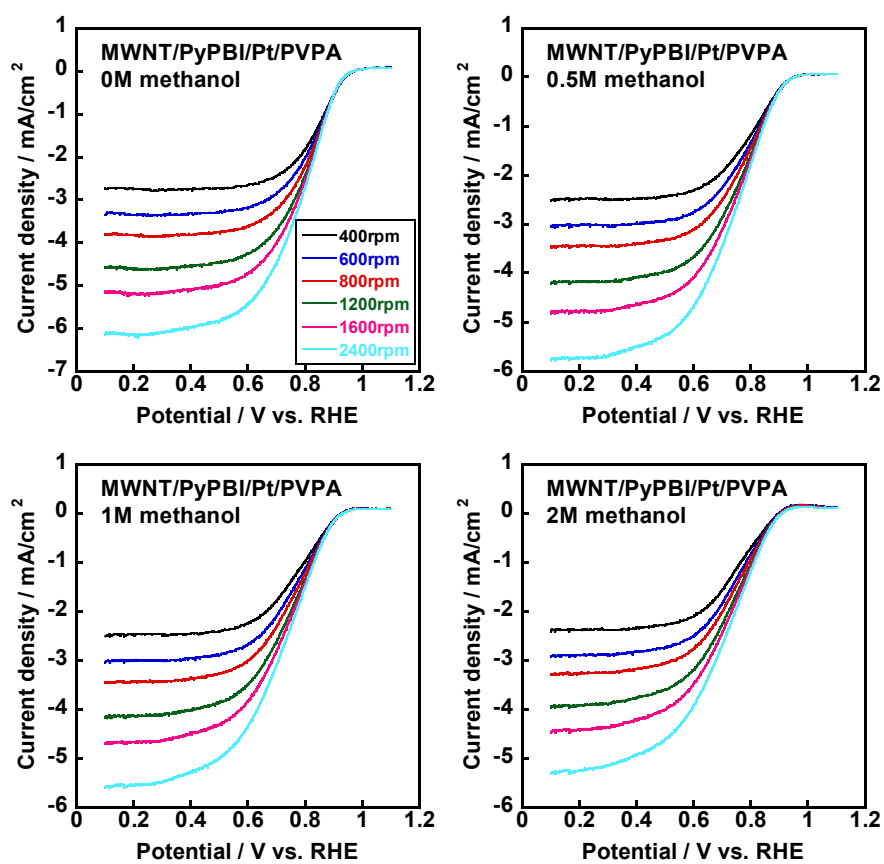


Figure S6] Rotating disc current density of MWNT/PyPBI/Pt/PVPA in O₂-saturated 0.1M HClO₄ and in the presence of different concentration of methanol electrolyte at 25 °C.

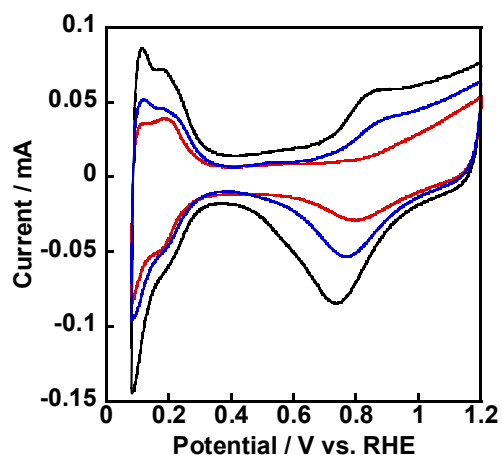


Figure S7 | CV curves recorded in 0.1M HClO₄ solutions at the scan rate of 50 mV/s for the CB/Pt (black), MWNT/PyPBI/Pt (blue) and MWNT/PyPBI/Pt/PVPA (red).

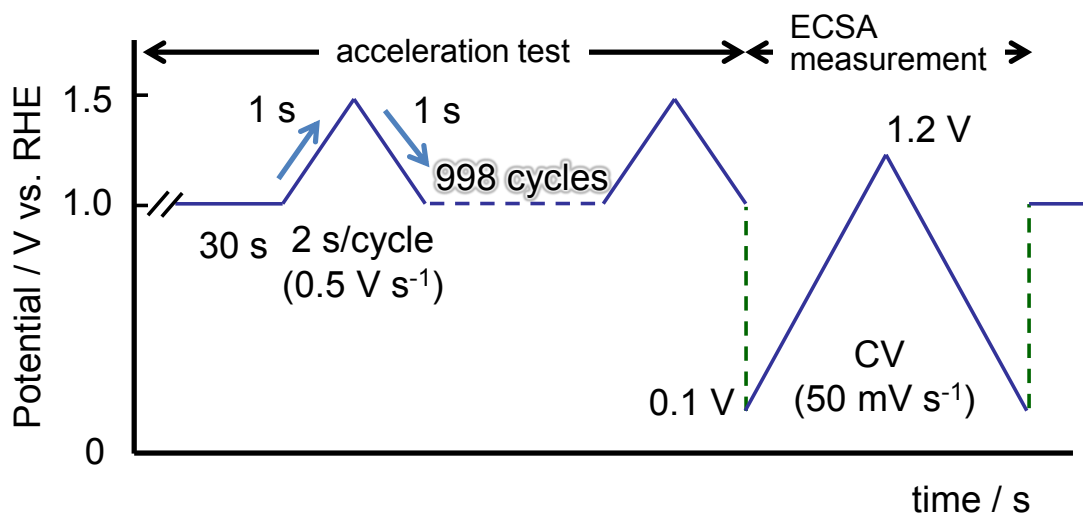


Figure S8 | Protocol of durability test for a half-cell based on the Fuel Cell Commercialization Conference of Japan.