Supporting Information

for

Bottom-up Design of a Stably CO-tolerant Platinum Electrocatalyst with Enhanced Fuel Cell Performance in Direct Methanol Fuel Cells

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Figure S1 New test protocol of the Pt stability test in half-cell proposed by the Fuel Cell Commercialization Conference of Japan (FCCJ).



Figure S2 XPS spectra of C_{1s} peaks of CB/PtRu (black line), CB/PBI/PtRu (blue line) and CB/PBI/PtRu/NC (red line), respectively.



Figure S3 Particle size distributions of CB/PtRu (a), CB/PBI/Pt/PVP (b) and CB/PBI/PVP/Pt (c) before the durability test.



Figure S4 HR-TEM image of CB/PBI/Pt/PVP and the PVP layer was indicated.



Figure S5 XPS spectra of Ru_{3p} peaks of CB/PtRu before (black line) and after (blue line) the durability test.



Figure S6 Particle size distributions of CB/PtRu (a), CB/PBI/Pt/PVP (b) and

CB/PBI/PVP/Pt (c) after the durability test.



Figure S7 CO stripping voltammograms of CB/PBI/Pt before durability test.