Supplemental information

PtRu/C catalyst slurry preparation for large-scale decal transfer with high performance of proton exchange membrane fuel cells

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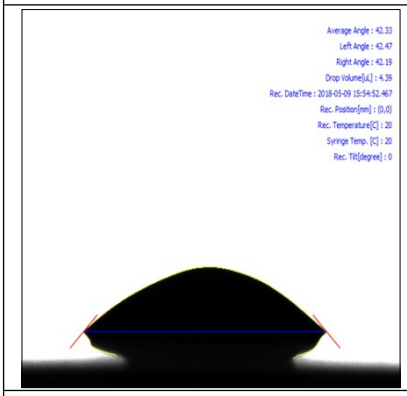
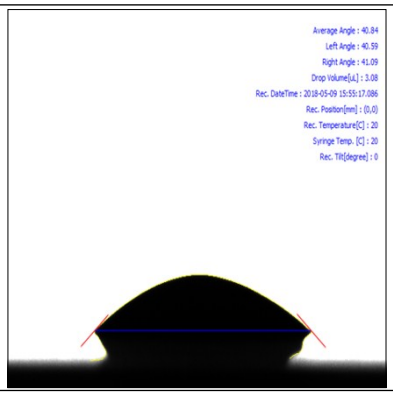
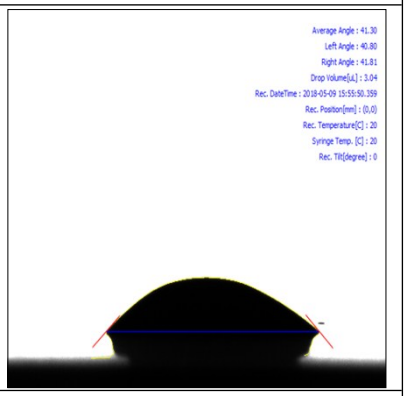
Run 1	Run 2	Run 3
		
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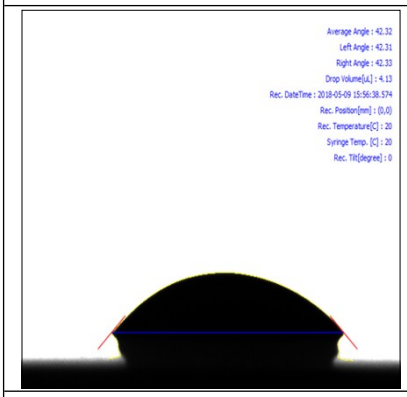
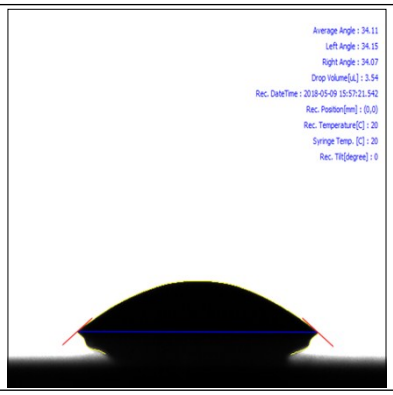
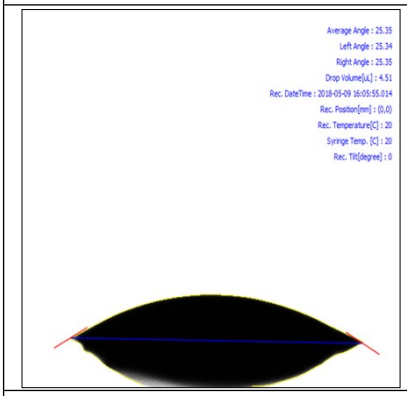
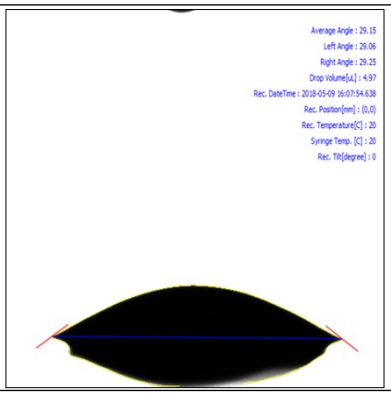
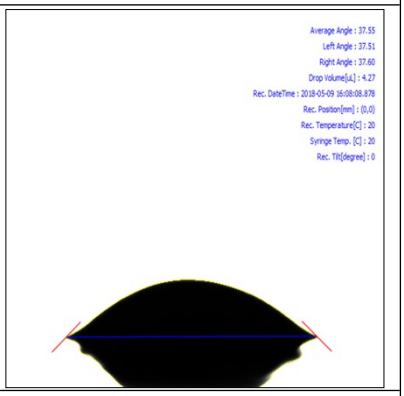
		

Sample	Run #	Contact angle / °
PtRu/C in IPA	1	42.3
	2	40.8
	3	41.3
	4	42.3
	5	34.1
	Standard deviation	3.5
	Coefficient of variation	8.60
	Average	**40.2**

Figure S1a: Contact angle picture of a PtRu/C catalyst slurry drop on a substrate Kapton film; PtRu/C in isopropyl alcohol (IPA) dispersion.

Run 1	Run 2	Run 3
		
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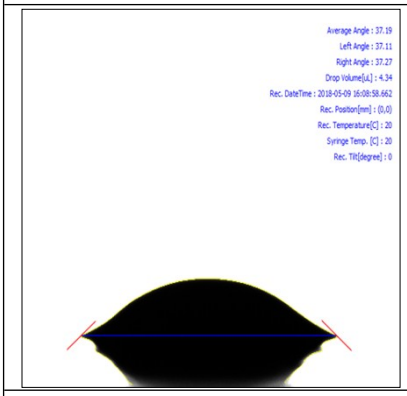
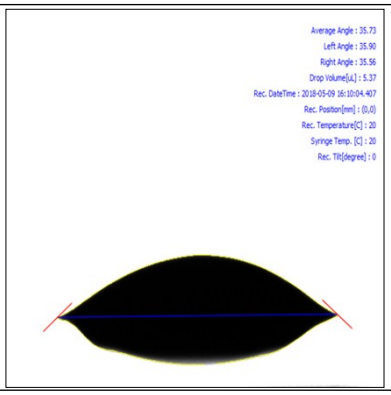
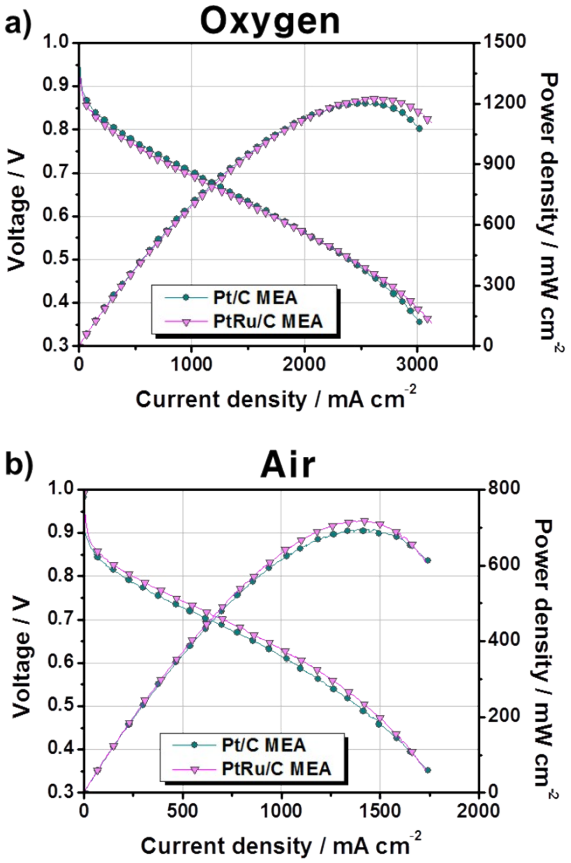
		

Sample	Run #	Contact angle / °
PtRu/C in MeOH	1	25.4
	2	29.2
	3	37.6
	4	37.2
	5	35.7
	Standard deviation	5.5
	Coefficient of variation	16.54
	Average	**33.0**

Figure S1b: Contact angle picture of a PtRu/C catalyst slurry drop on a substrate Kapton film; PtRu/C in methanol (MeOH) dispersion.



	Current density at 0.6V (mA cm^{-2})	Maximum Power Density (mW cm^{-2})	Current density at 0.6V (mA cm^{-2})	Maximum Power Density (mW cm^{-2})
Pt/C MEA	1741	1202	1067	696
PtRu/C MEA	1722	1224	1146	747

Figure S2: Polarization and power density curves of Pt/C- and PtRu/C-based MEA using decal transfer method under a) H_2 / O_2 and b) H_2 / air. The active cell area was 5.0 cm^2 and test was performed at 70 °C and fully humidified H_2 and O_2 / air were used in the MEA under atmospheric pressure. The anode was commercial PtRu/C (53.5 wt.% TKK Catalyst, 0.20 mg_{Pt} cm^{-2}) and the cathode catalyst was a commercial Pt/C (40.0 wt.% JM Catalyst, 0.30 mg_{Pt} cm^{-2})