Supporting Information

Nanomaterial Enhanced Polyelectrolyte Membranes for Hydrogen-Oxygen Fuel cells

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Table S1. Validation of SPEEK membrane

SPEEK	
Current density Vs power density	**Current density Vs voltage**
$f(x) = P1 * X^3 + P2 * X^2 + P3 * X + P4$	$f(x) = P1 * X + P2$
Coefficients (with 95% confidence bounds):	Coefficients (with 95% confidence bounds):
P1 = 2.581e-05 (-1.742e-05, 6.903e-05)	P1 = -0.00102 (-0.001229, -0.0008114)
P2 = -0.003952 (-0.01049, 0.002589)	P2 = 0.6988 (0.683, 0.7146)
P3 = 0.796 (0.38, 1.212)	
P4 = -0.4864 (-8.549, 7.576)	
Accuracy of given data:	Accuracy of given data:
SSE: 202.8	SSE: 0.001515
R-square: 0.9971	R-square: 0.9982
Adjusted R-square: 0.9954	Adjusted R-square: 0.9978
RMSE: 3.806	**RMSE: 0.009175**

Table S2. Validation of SPEEK/SMMT membrane

SPEEK/SMMT	
Current density Vs power density	**Current density Vs voltage**
$f(x) = P1 * X^3 + P2 * X^2 + P3 * X + P4$	$f(x) = P1 * X^3 + P2 * X^2 + P3 * X + P4$
Coefficients (with 95% confidence bounds):	Coefficients (with 95% confidence bounds):
P1 = -6.799e-05 (-0.001375, 0.001239)	P1 = -5.449e-06 (-8.524e-06, -2.375e-06)
P2 = 0.00303 (-0.04821, 0.05427)	P2 = 0.0003038 (0.0001832, 0.0004244)
P3 = 0.7301 (-0.1294, 1.59)	P3 = -0.009259 (-0.01128, -0.007236)
P4 = 0.6238 (-3.916, 5.163)	P4 = 0.8466(0.8359, 0.8572)
Accuracy of given data:	Accuracy of given data:
SSE: 60.96	SSE: 0.0003376
R-square: 0.9988	R-square: 0.9992
Adjusted R-square: 0.9979	Adjusted R-square: 0.9986
RMSE: 2.165	**RMSE: 0.005096**

Table S3. Validation of NAFION membrane

NAFION	
Current density Vs power density	**Current density Vs voltage**
$f(x) = P1 * X^2 + P2 * X + P3$	$f(x) = P1 * X^2 + P2 * X + P3$
Coefficients (with 95% confidence bounds):	Coefficients (with 95% confidence bounds):
P1 = -0.0008394 (-0.001964, 0.0002855)	P1 = 7.912e-05 (3.359e-05, 0.0001247)
P2 = 0.7068 (0.4923, 0.9213)	P2 = -0.00758 (-0.01006, -0.005103)
P3 = -0.4794 (-12.58, 11.62)	P3 = 0.935 (0.9089, 0.9611)
Accuracy of given data:	Accuracy of given data:
SSE: 235	SSE: 0.0003528
R-square: 0.9962	R-square: 0.9996
Adjusted R-square: 0.9938	Adjusted R-square: 0.9988
RMSE: 5.42	**RMSE: 0.009391**