



FLORIDA SOLAR ENERGY CENTER®

Creating Energy Independence

Recent Fuel Cell Research Activities at Florida Solar Energy Center

M. P. Rodgers, R. P. Brooker, N. Mohajeri, B. P. Pearman, L. J. Bonville, D. K. Slattery

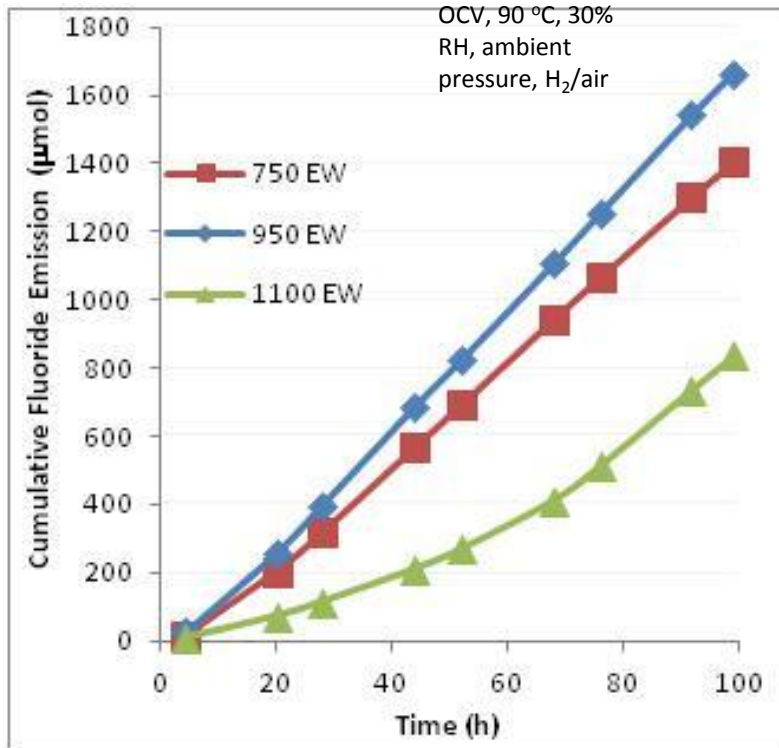
2014 Florida Energy Systems Consortium Workshop

May 12-13, 2014

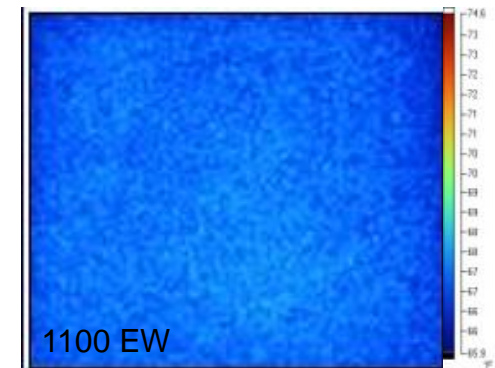
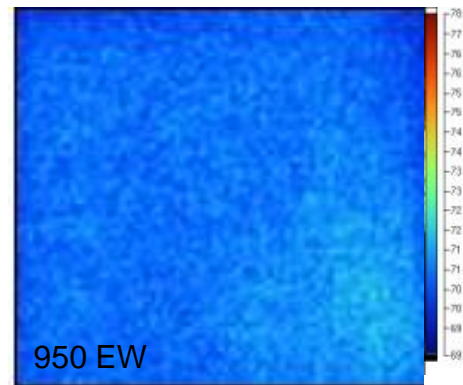
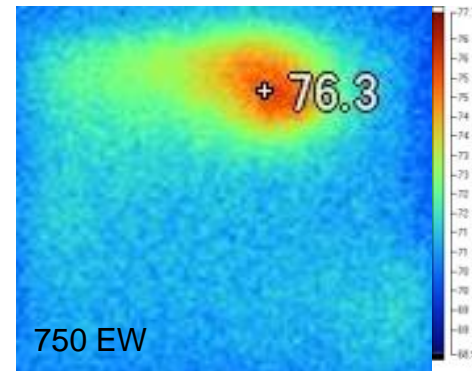
Gainesville, Florida



Membrane Durability: Impact of EW

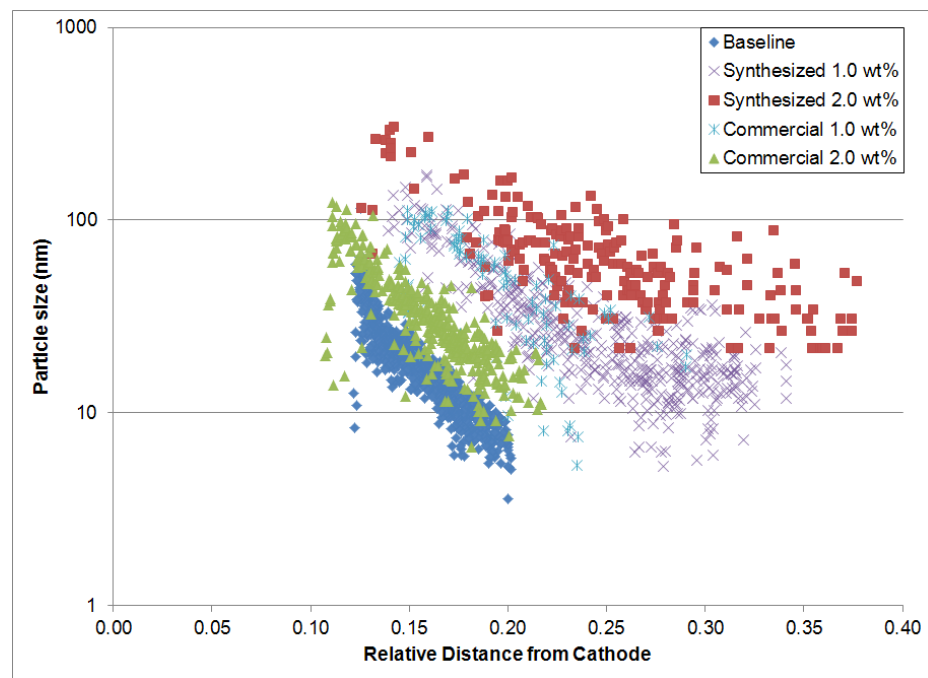
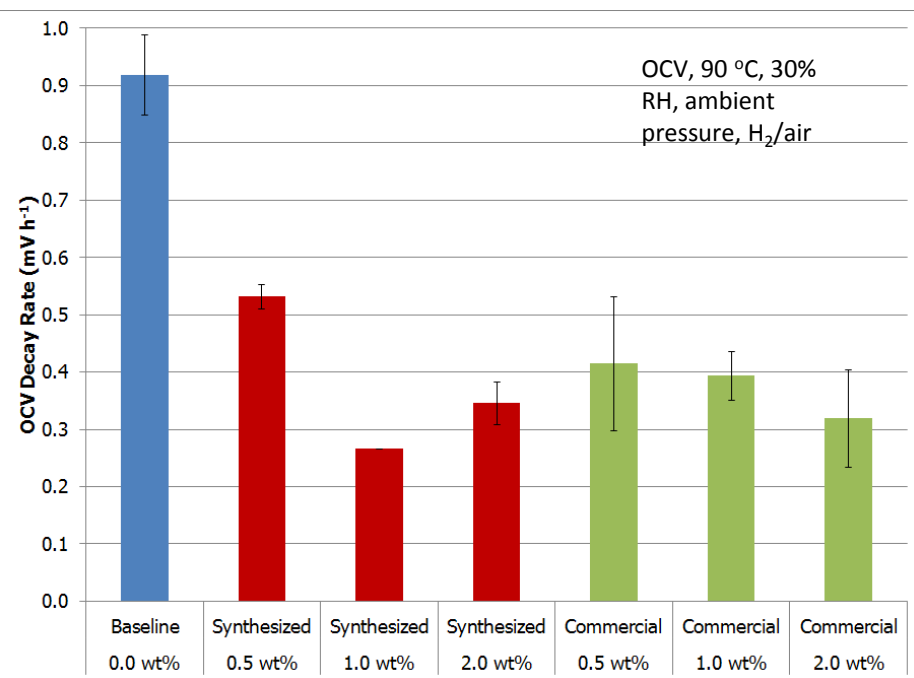


IR images of active area



- Equivalent weight of the membrane impacted durability

Membrane Durability: Impact of Ceria in the Membrane



- Ceria in the membrane improves durability
- With ceria, the Pt particles are larger and fewer
 - Extend further into the membrane

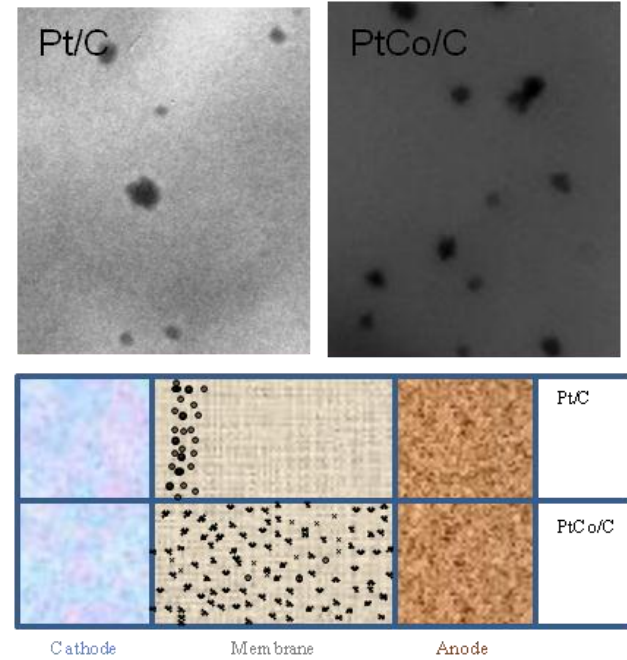
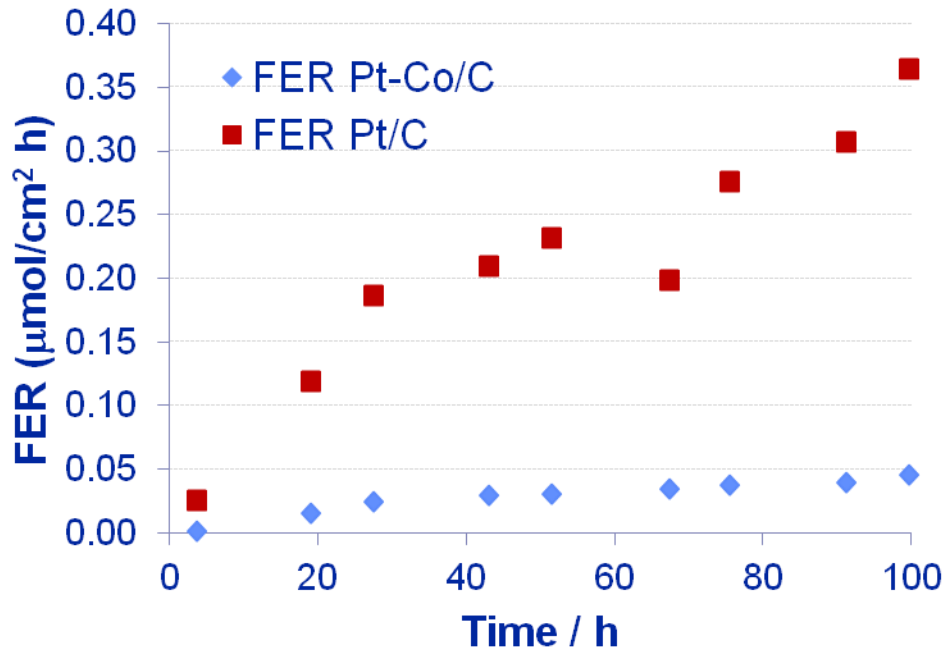


B.P. Pearman et al. Journal of Power Sources, 225, 75-83, 2012

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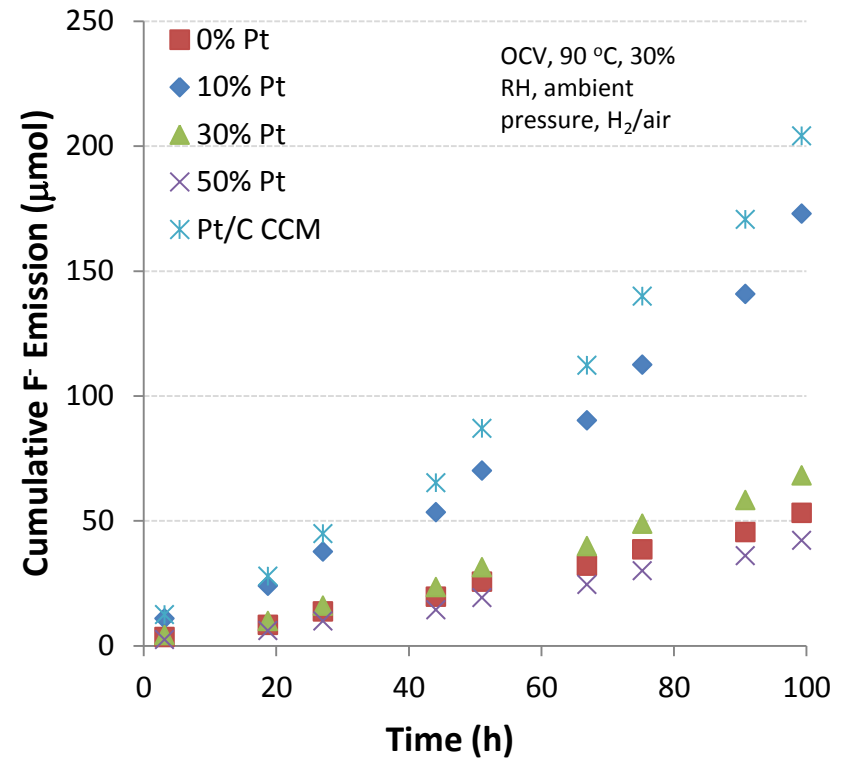
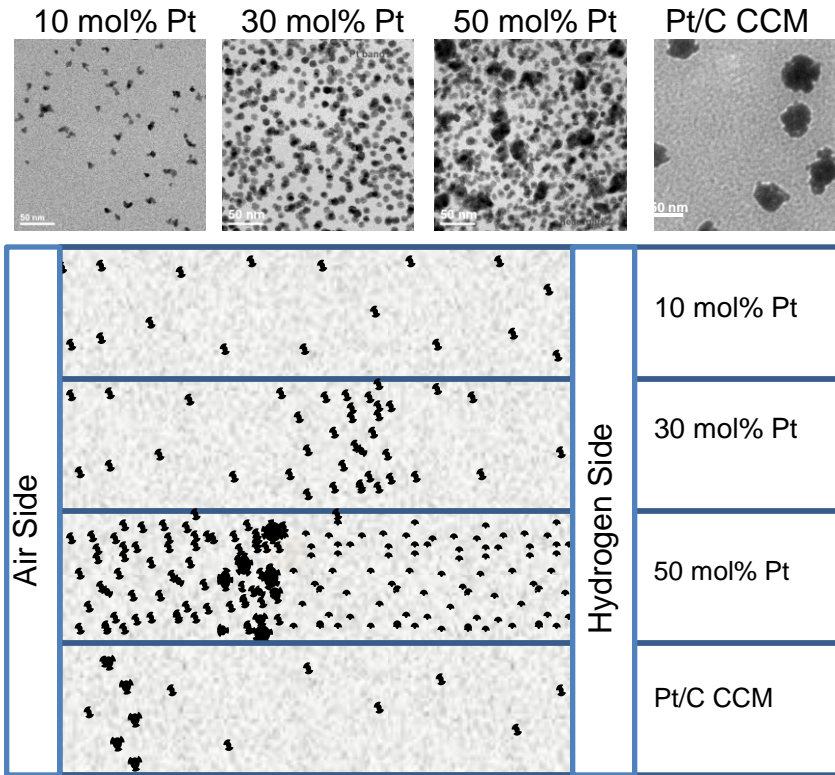


Effect of Catalyst Type



- CCMs with Pt/C and PtCo/C in the electrodes were OCV tested
 - Improved cell durability with PtCo/C rather than Pt/C
 - The different catalysts resulted in different Pt profiles in the PEM:
 - Pt/C resulted in Pt band formation and larger Pt particles
 - PtCo/C results in Pt distributed throughout the membrane

Impact of Pt Loading in the Membrane



- 10 mol% Pt resulted in similar degradation as Pt/C CCM although Pt distribution after testing was different