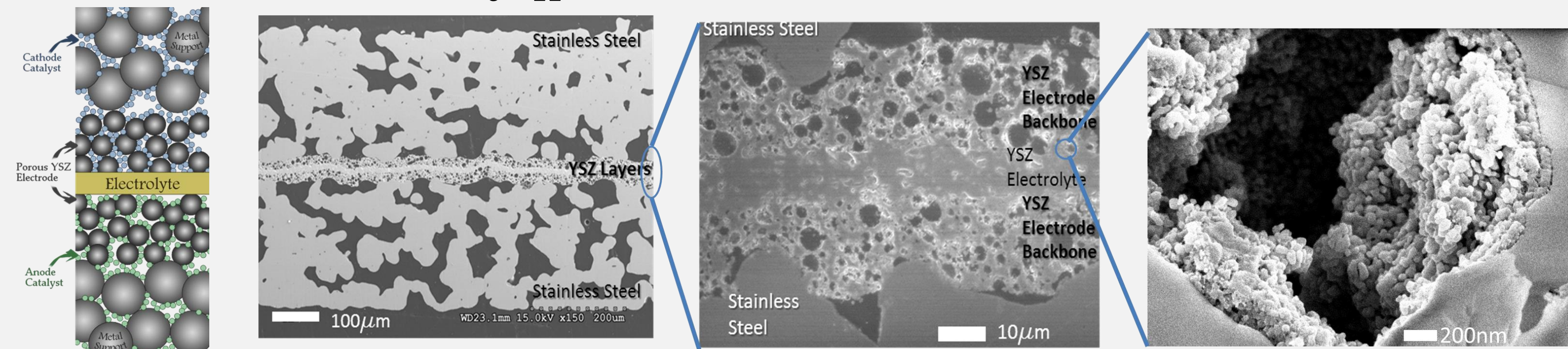


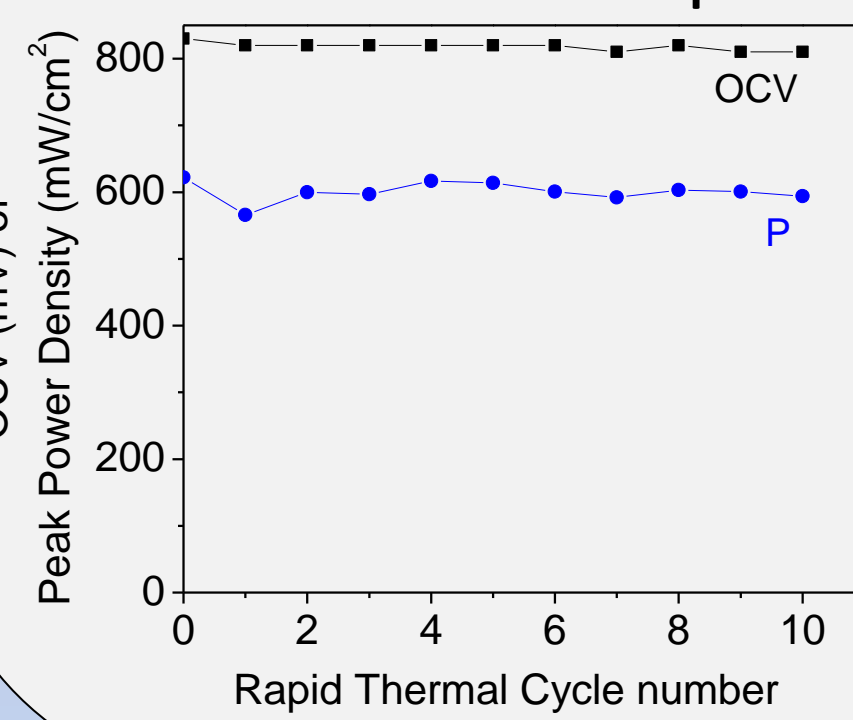
Metal-Supported Cell

Symmetric backbone of stainless steel and ScSZ electrolyte/electrodes
 Pr_6O_{11} and SDC-Ni infiltrated into electrodes

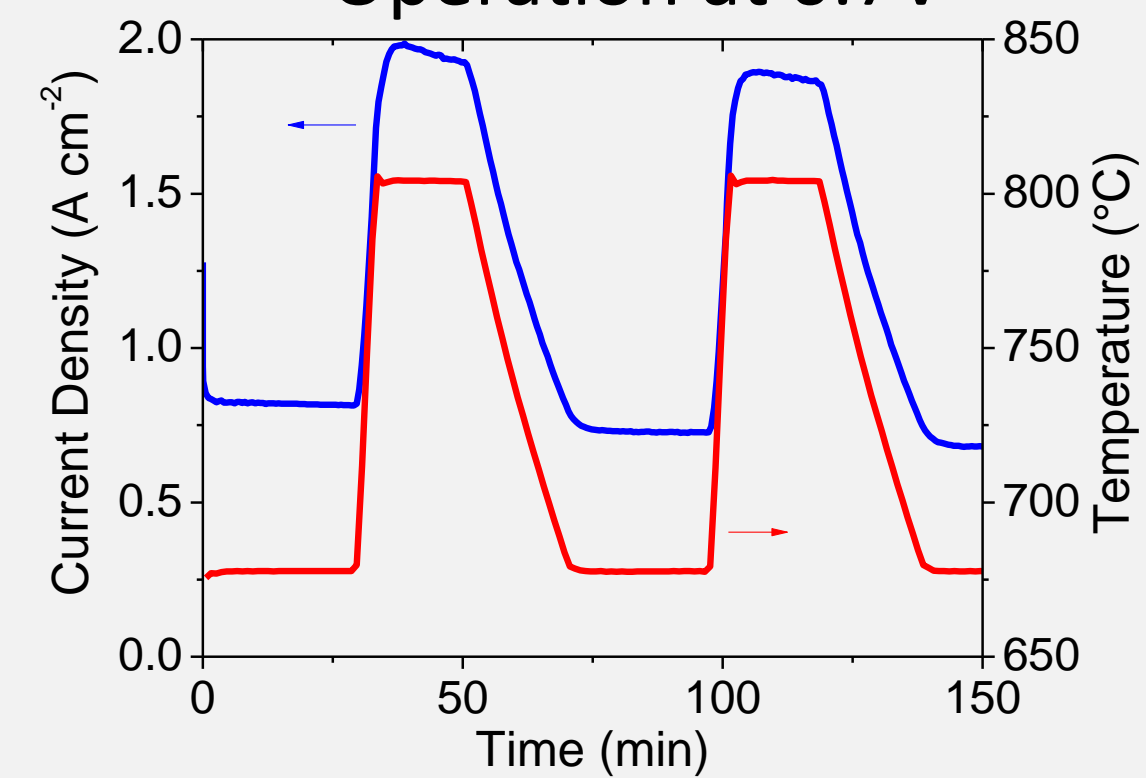


Robust Thermal and Redox Cycling

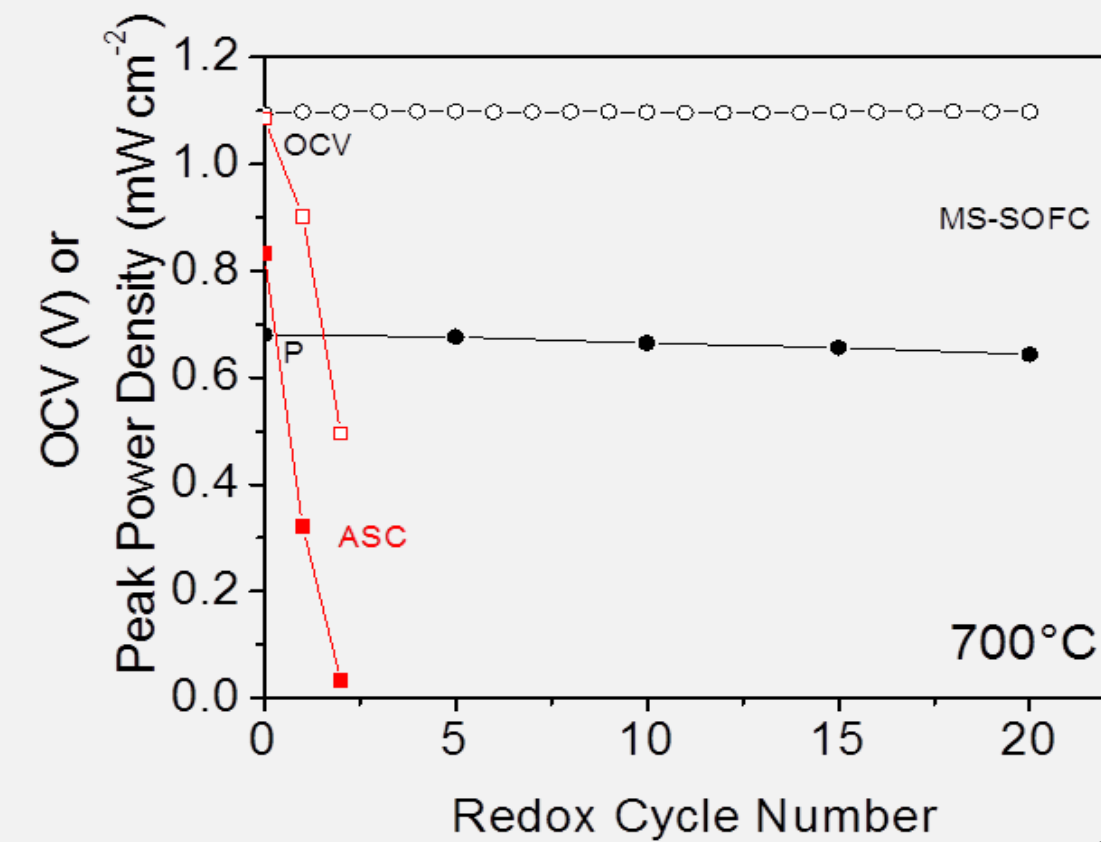
Thermal Cycling
15 min startup



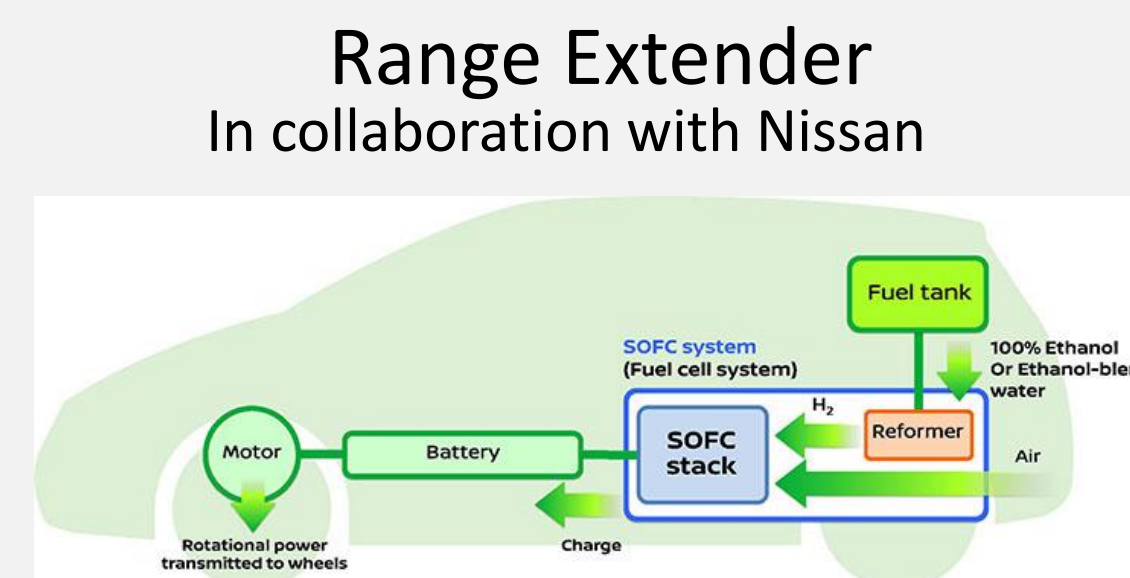
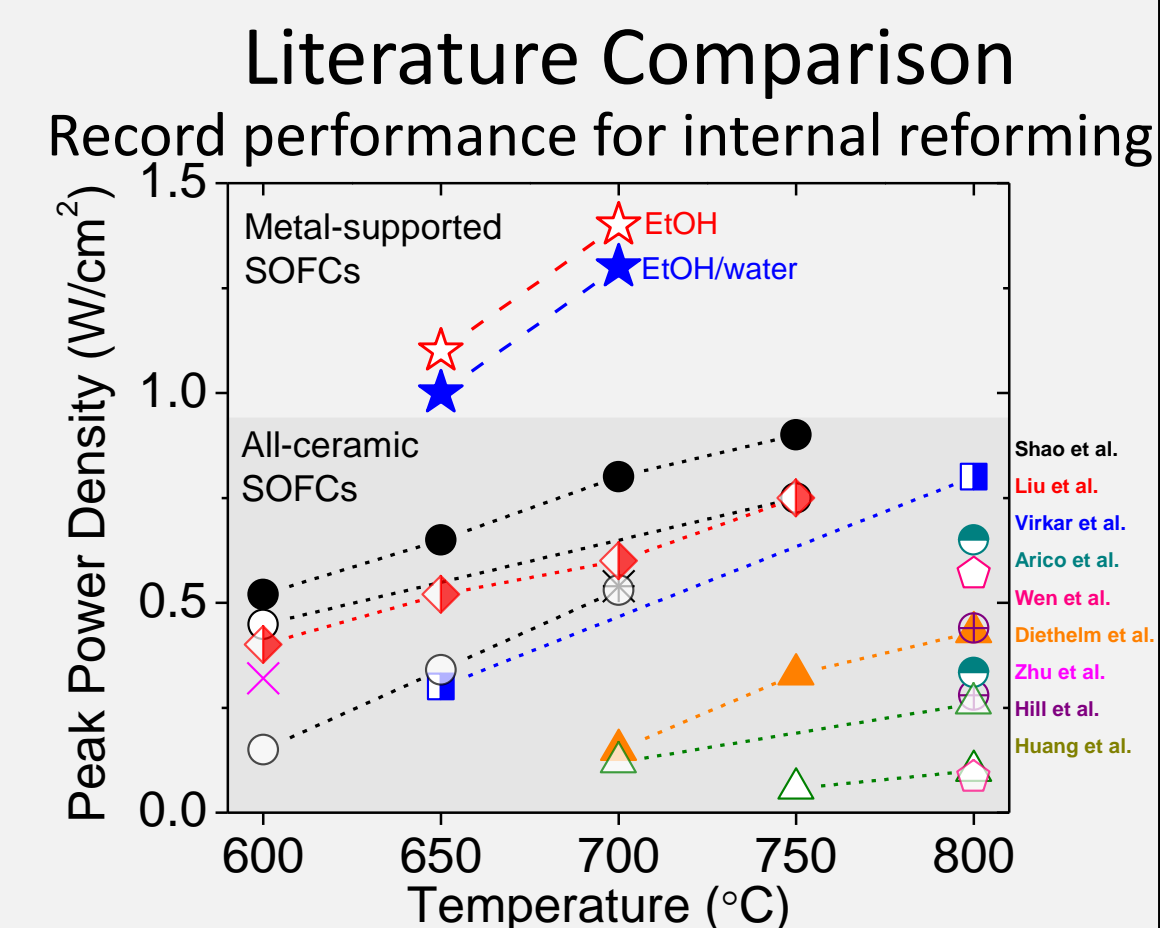
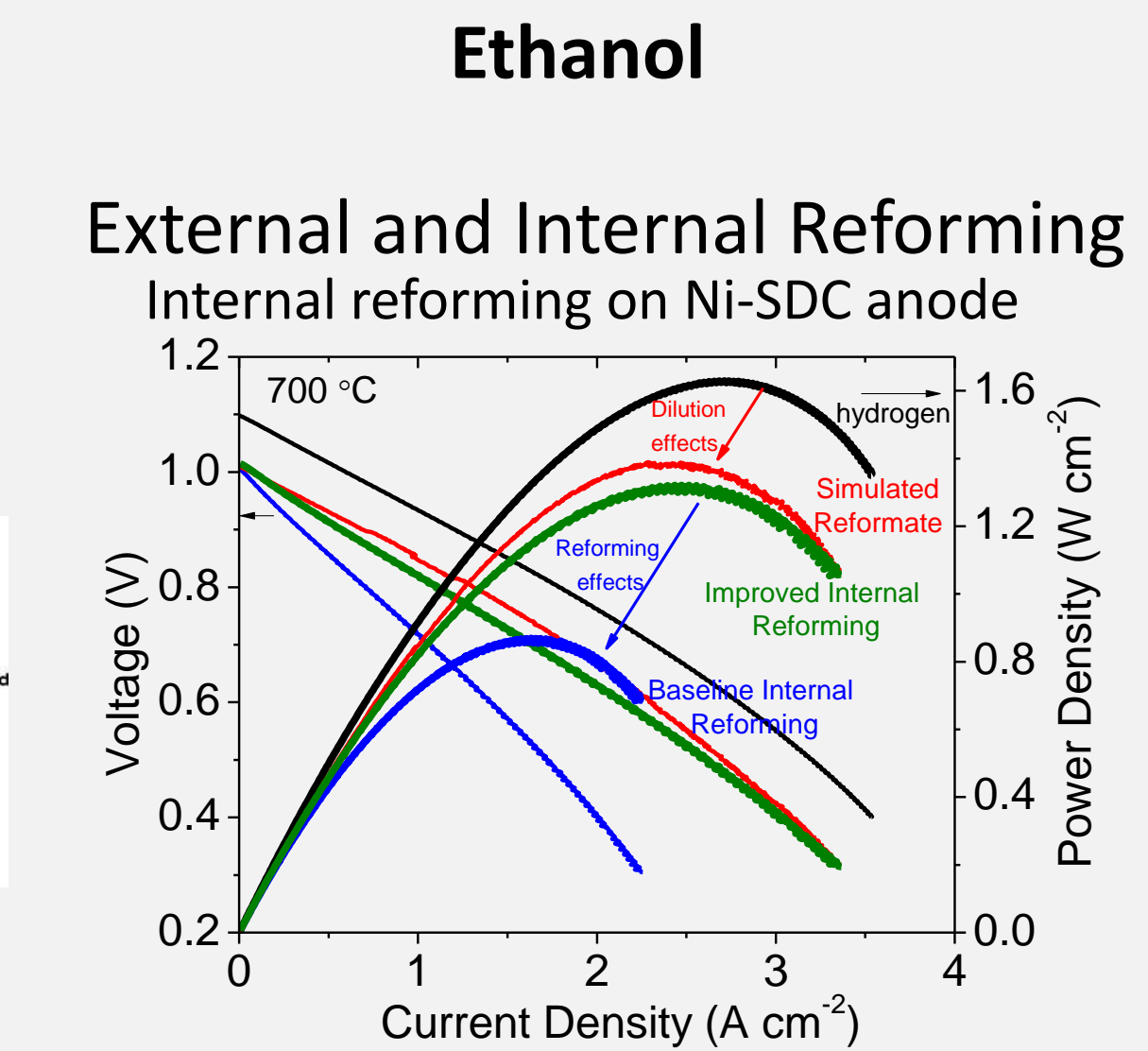
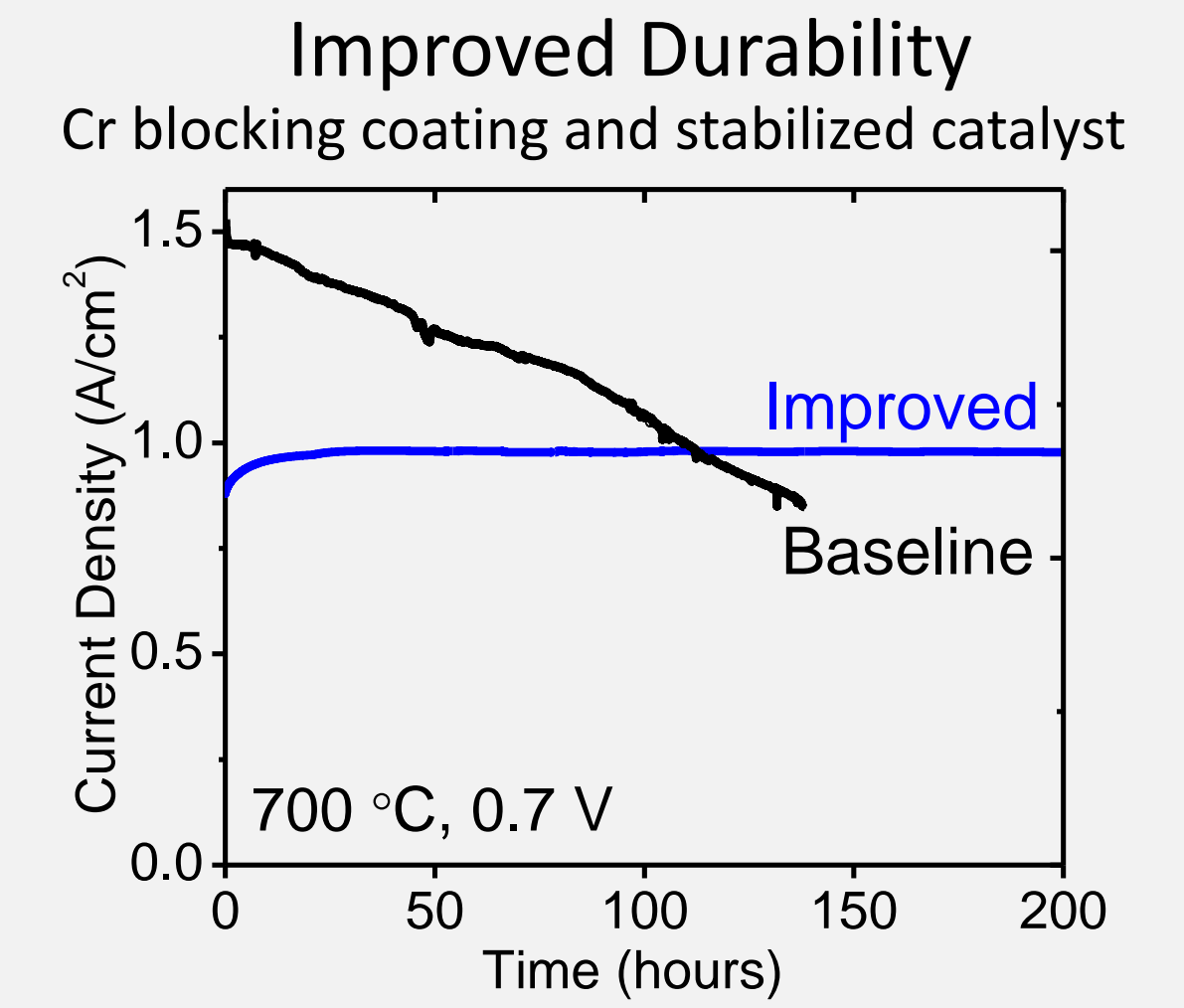
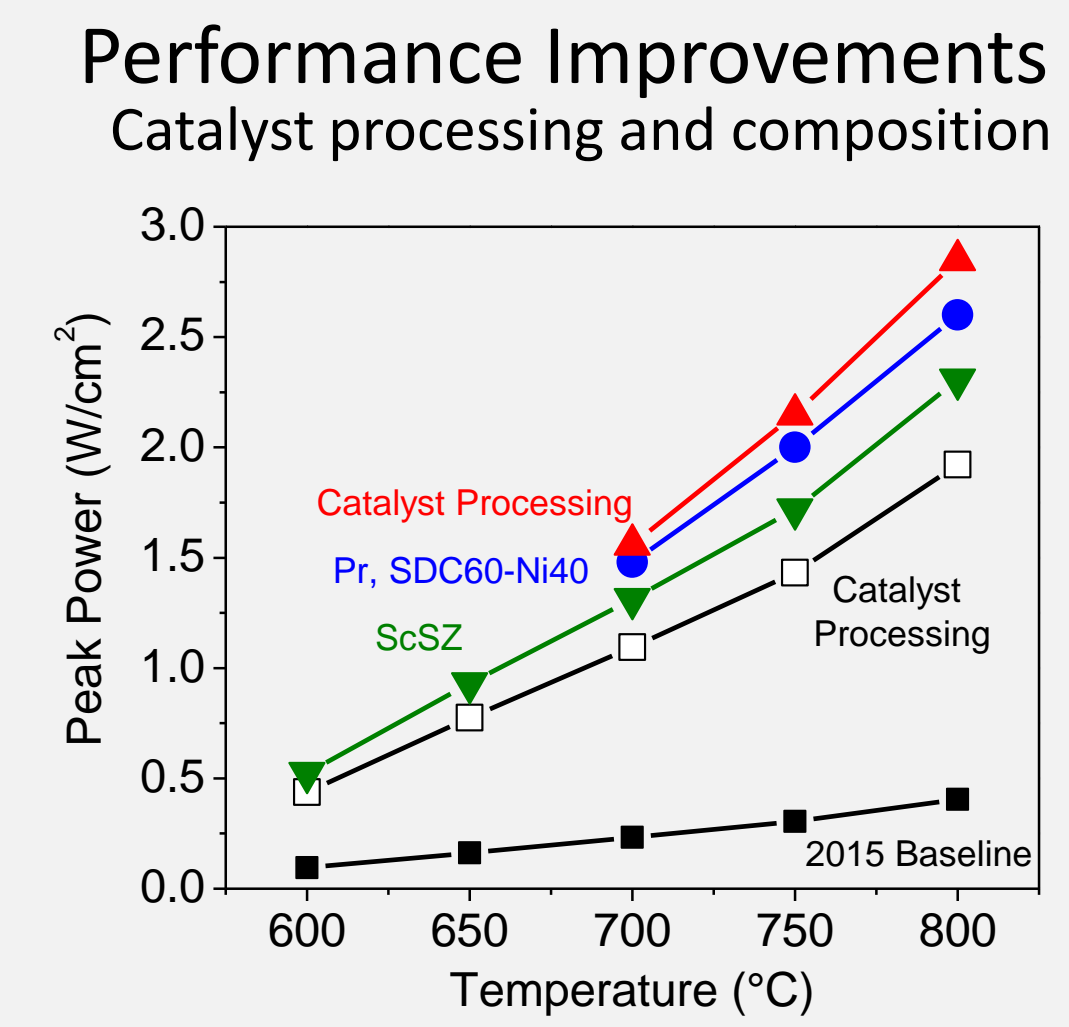
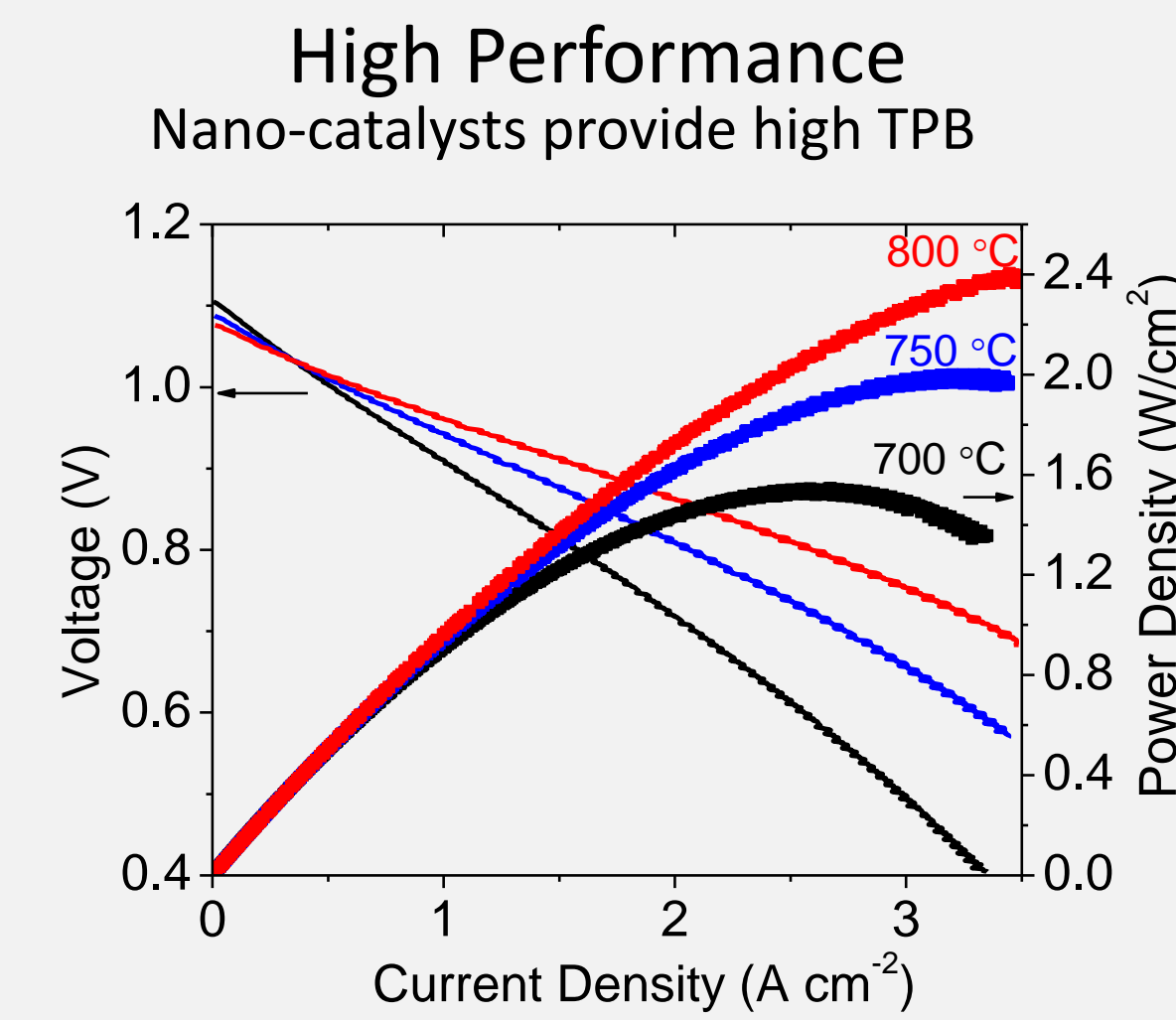
Dynamic Temperature
Operation at 0.7V



Full Redox Cycling

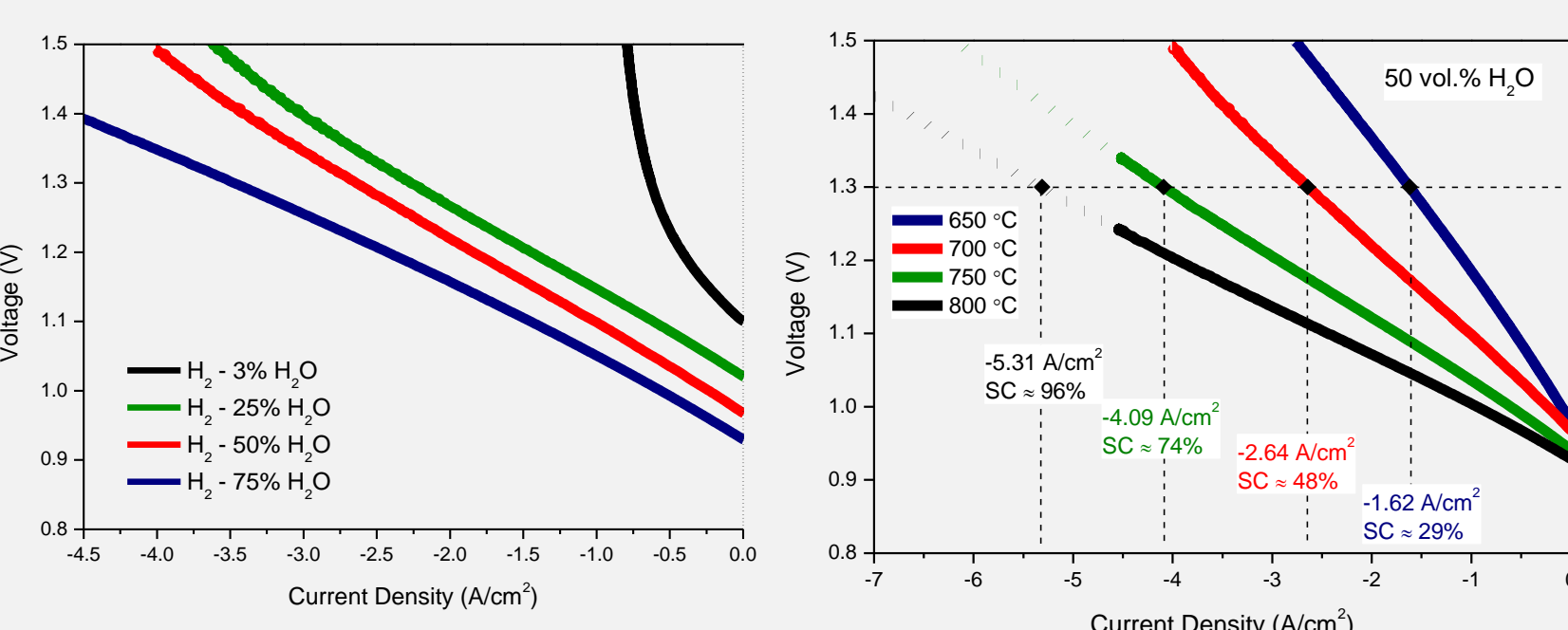


Fuel Cell Performance

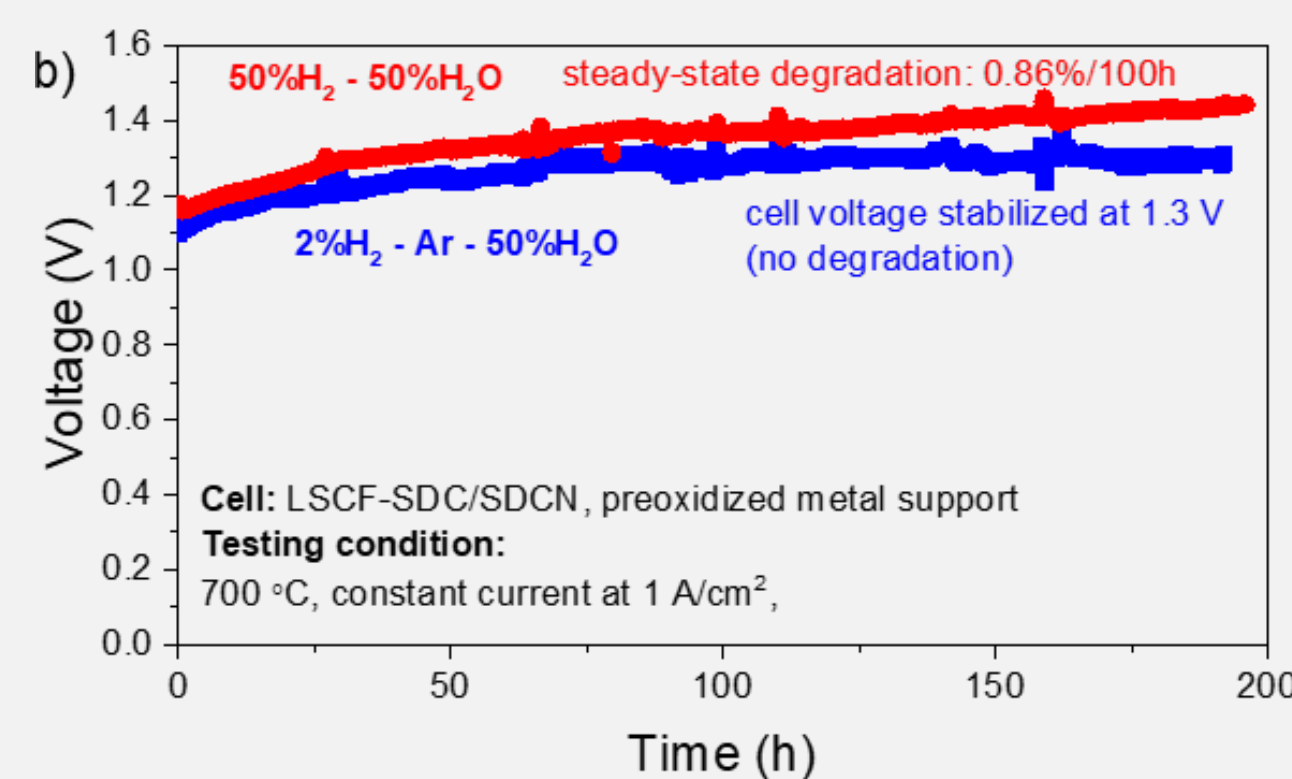


Electrolysis

High performance for steam to hydrogen

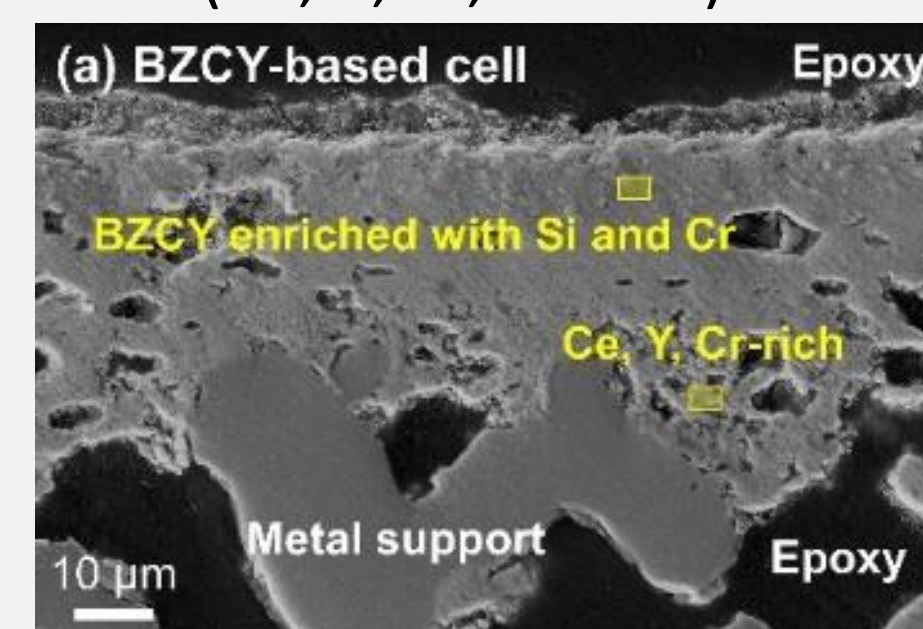


Improving durability



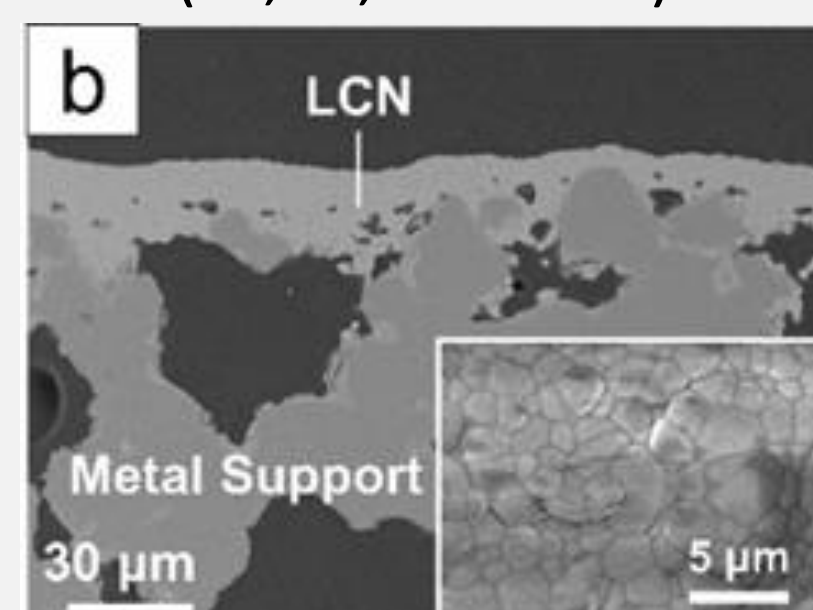
Metal-Supported Proton Conductor BZCY

(Ba,Zr,Ce,Y-oxide)



In reducing atmosphere sintering:
 - Ba evaporation
 - Si and Cr migrate from metal to BZCY
 - Sintering at <1450C is challenging

LCN



LCN co-sinters easily with stainless steel
 BUT: low proton conductivity

Direct-Flame Camping/Emergency Product

5-Cell MS-SOFC Stack

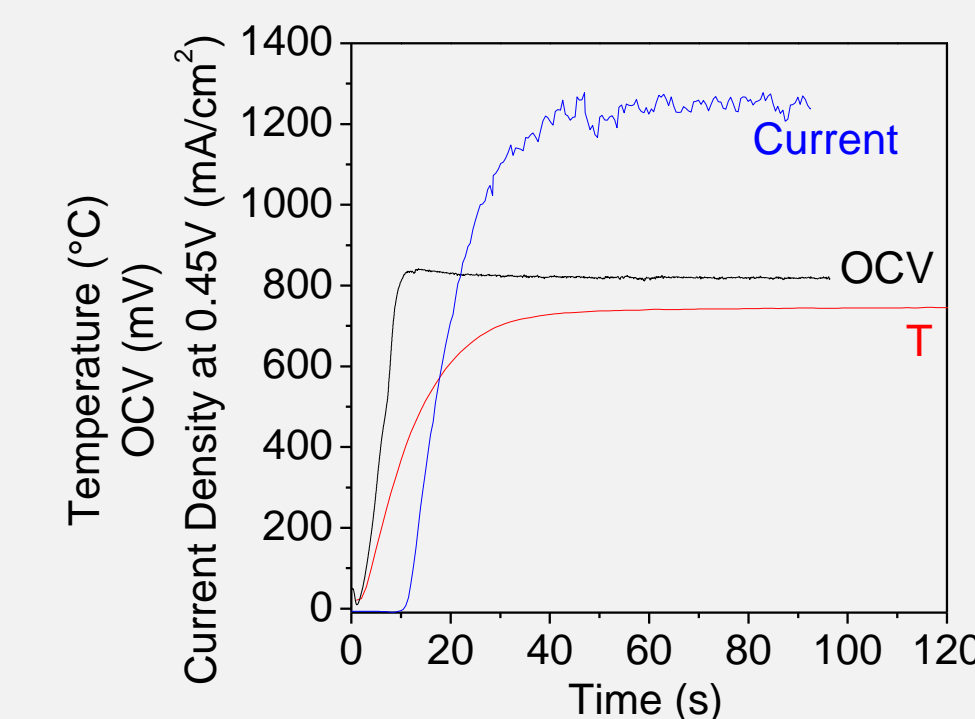
Steel mesh electrical connections spot-welded to cells



Nighttime outdoor operation
 LED lighting and mobile phone charging on demand



Power in 10 seconds



Stack performance
 Maximum power 2.7W

