

# Engineering Porous Electrodes for Redox Flow Batteries

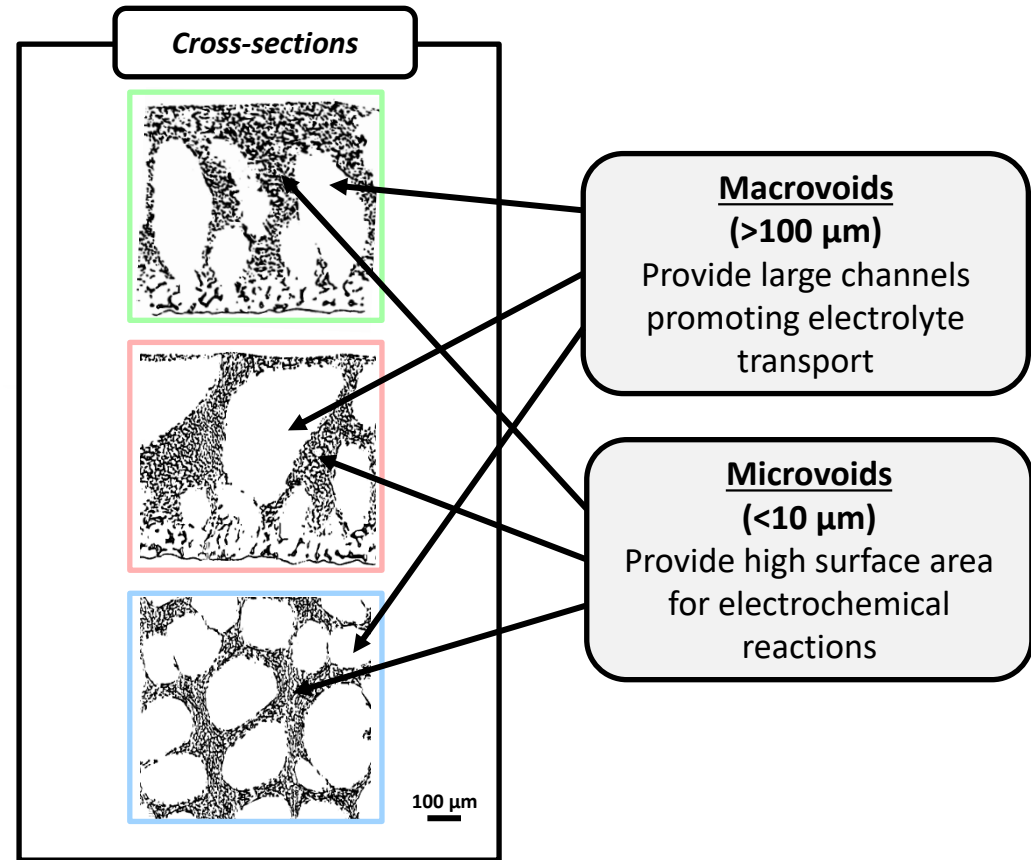
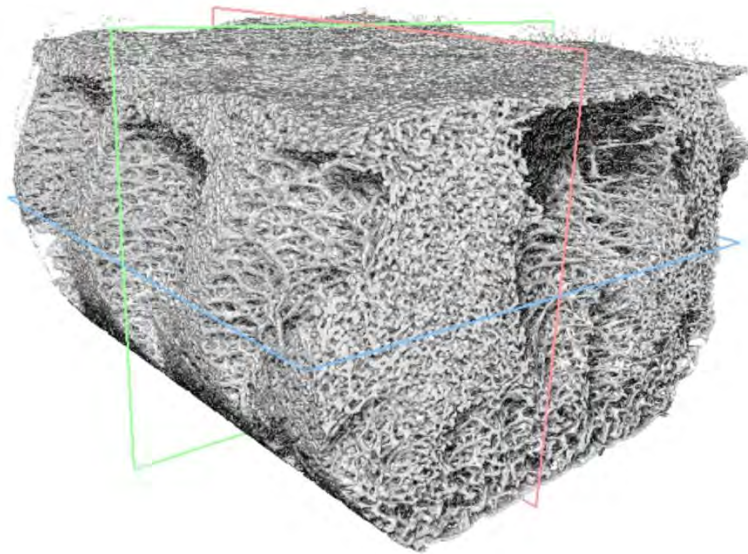
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HIGREEW Workshop – Flow Batteries, bringing the technology to the market  
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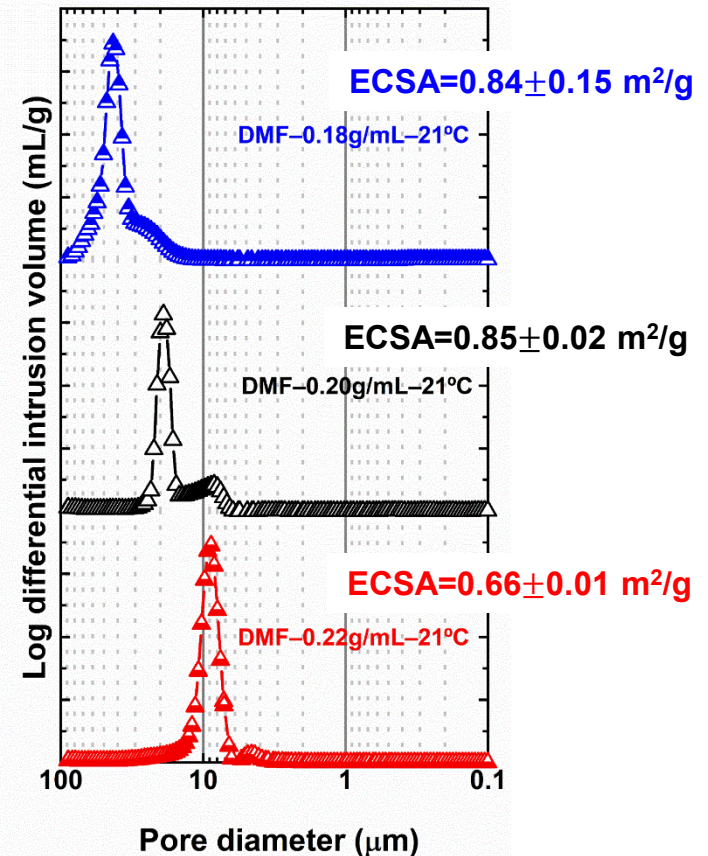
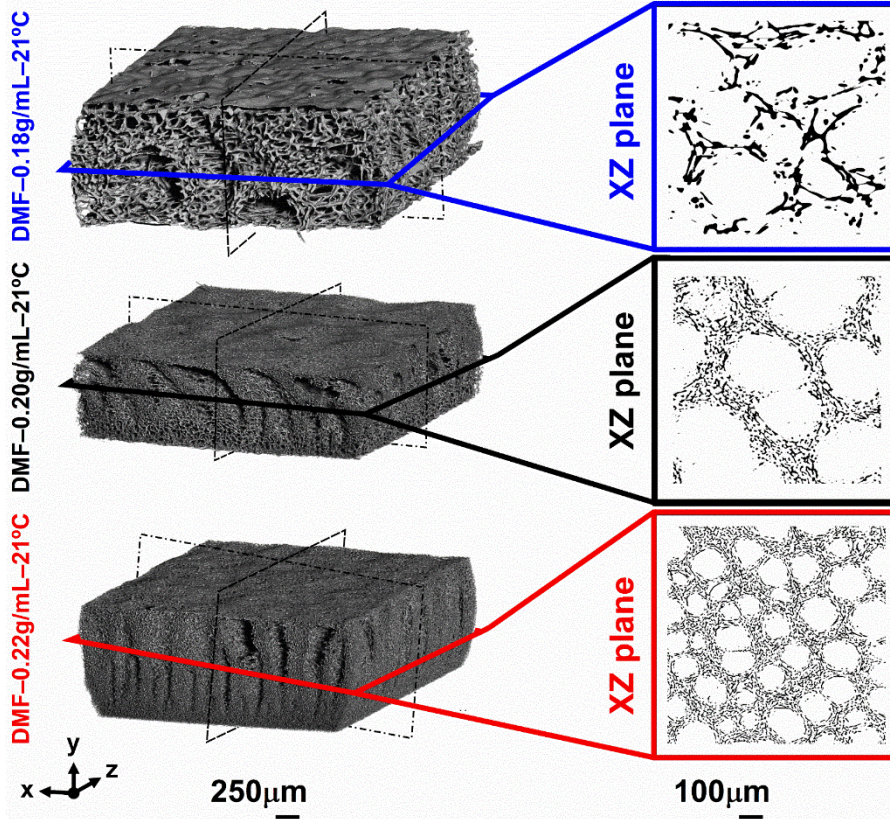
# Characteristics of fabricated electrode microstructure

*Representative X-ray tomography (PSP – 2:3)*



# Tailoring microstructure: *polymer concentration*

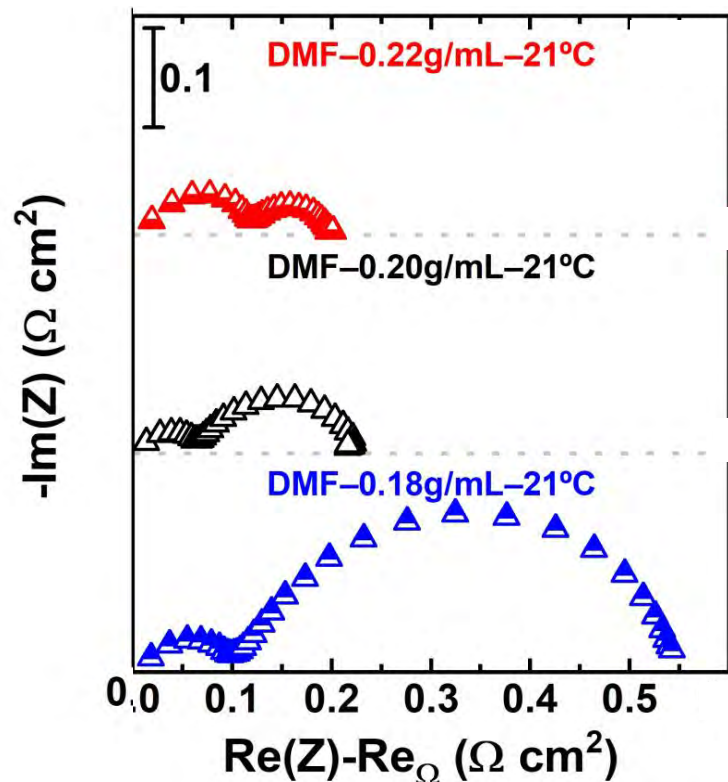
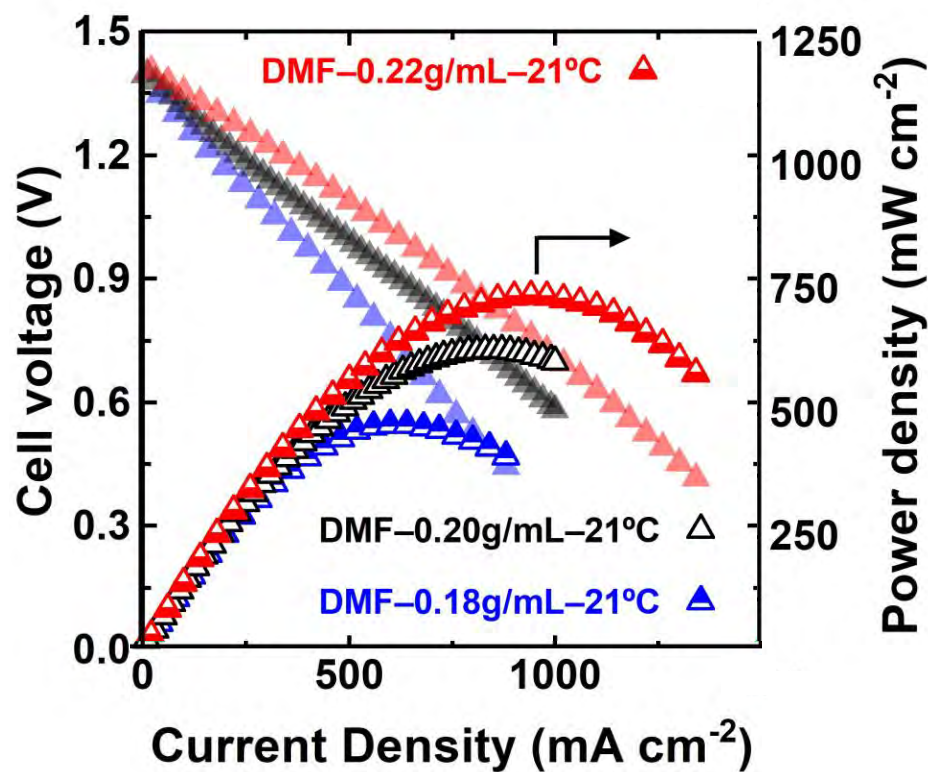
Increasing total polymer concentration



Regulating the coalescence process (through viscosity) during phase separation is a powerful approach to tune pore size

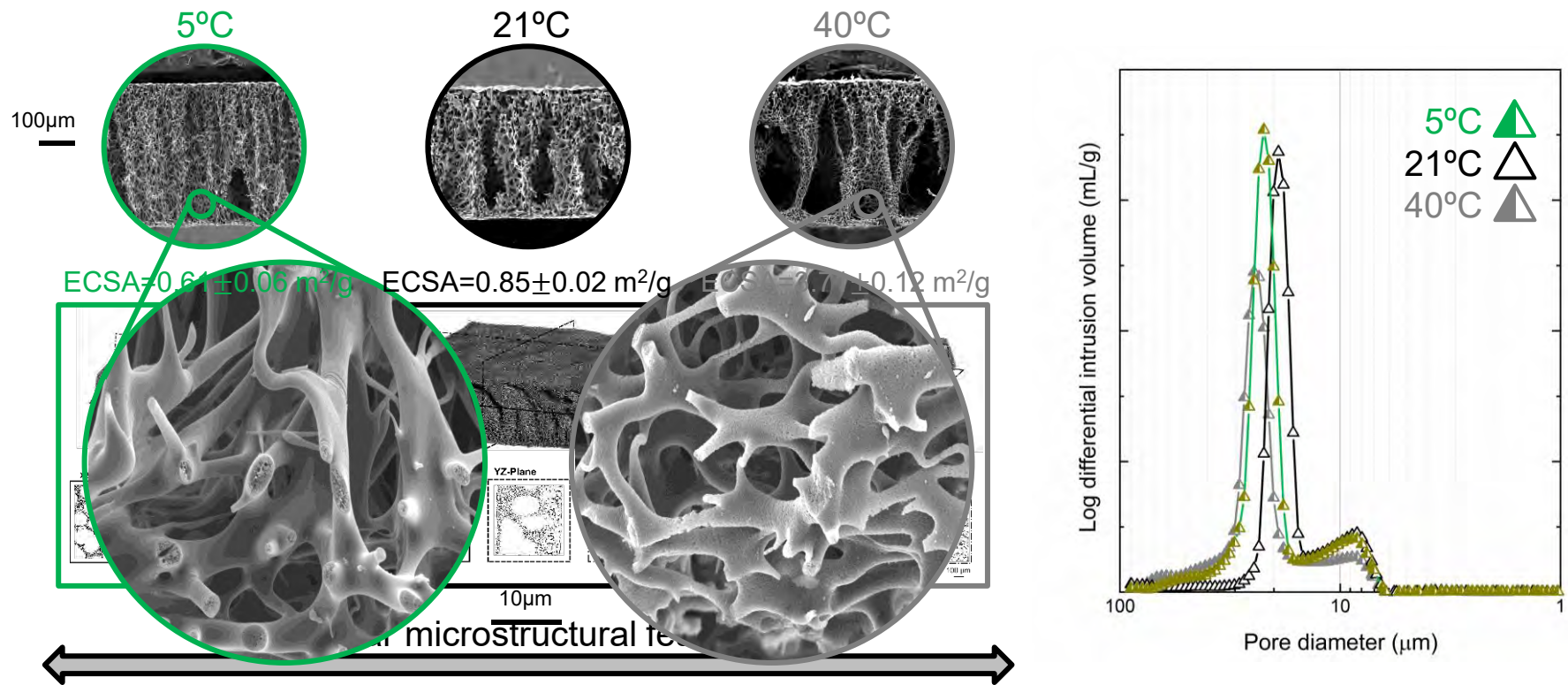


# Narrower pores facilitate mass transport



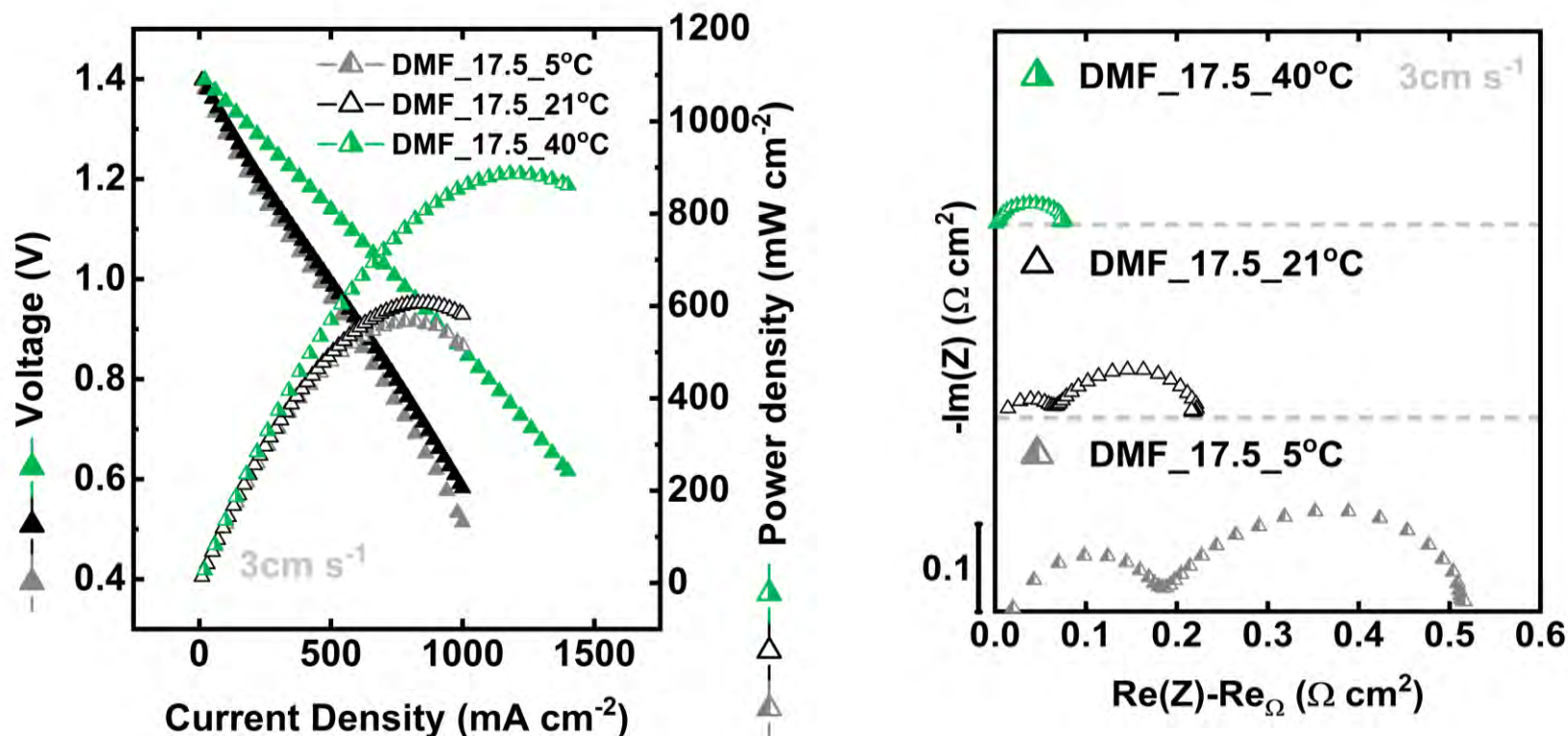
Narrower pore sizes result in higher electrochemical performance and reduced mass transfer resistance (shorter diffusion distances)

# Tailoring microstructure – *Bath temperature*



**Higher temperatures induce additional nano-scale phase separation, which results in a significant increase in available surface area.**

# Higher surface area boost VRFB performance



The higher surface area impacts the performance of the flow battery by reducing activation overpotentials.