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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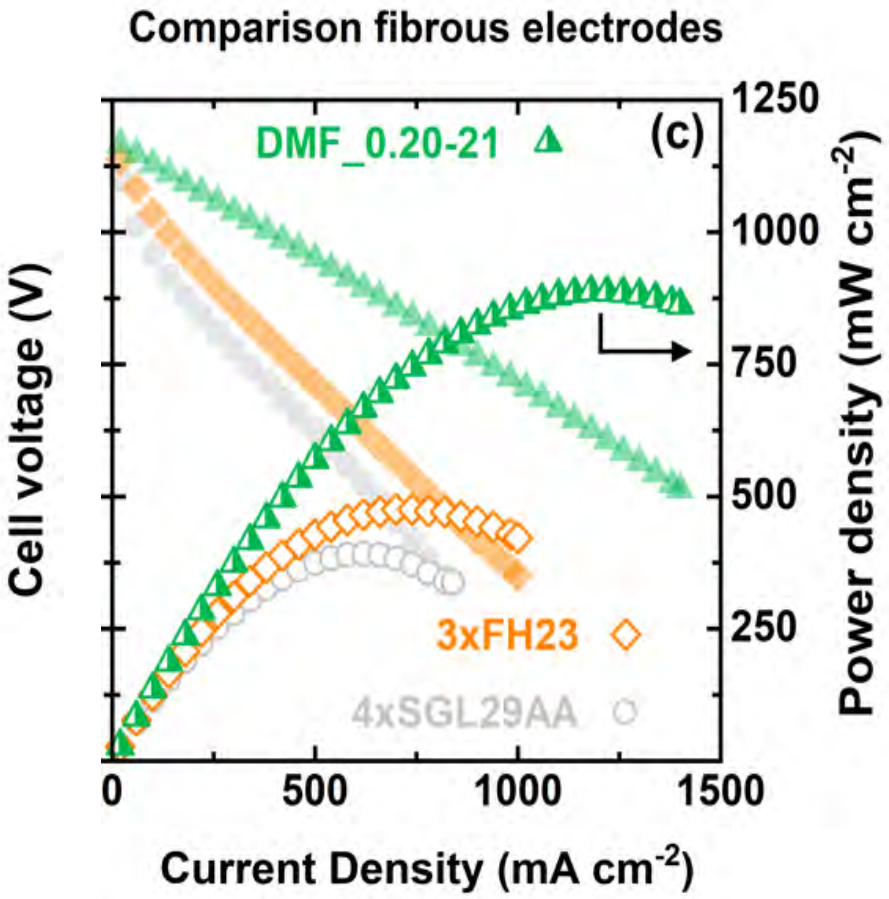
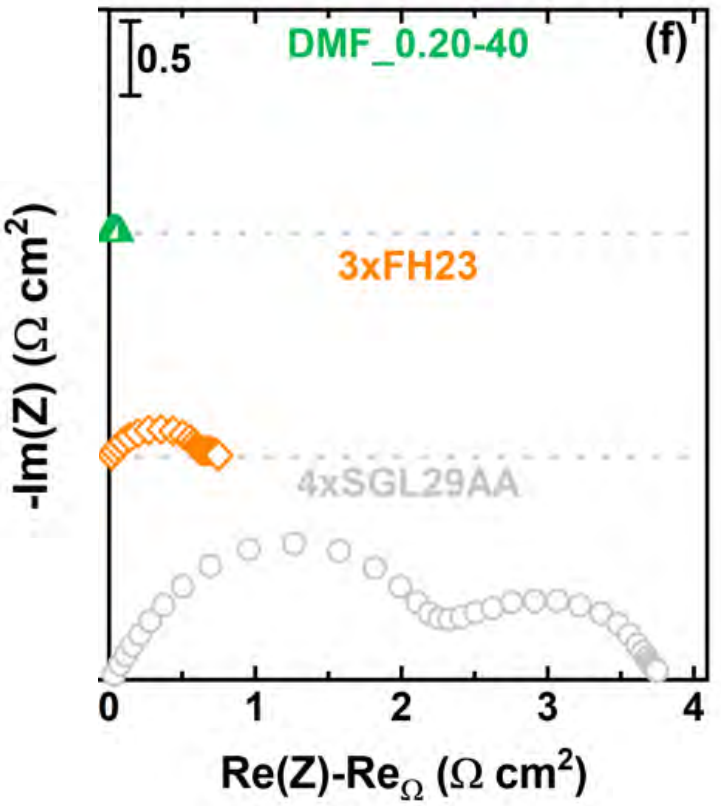
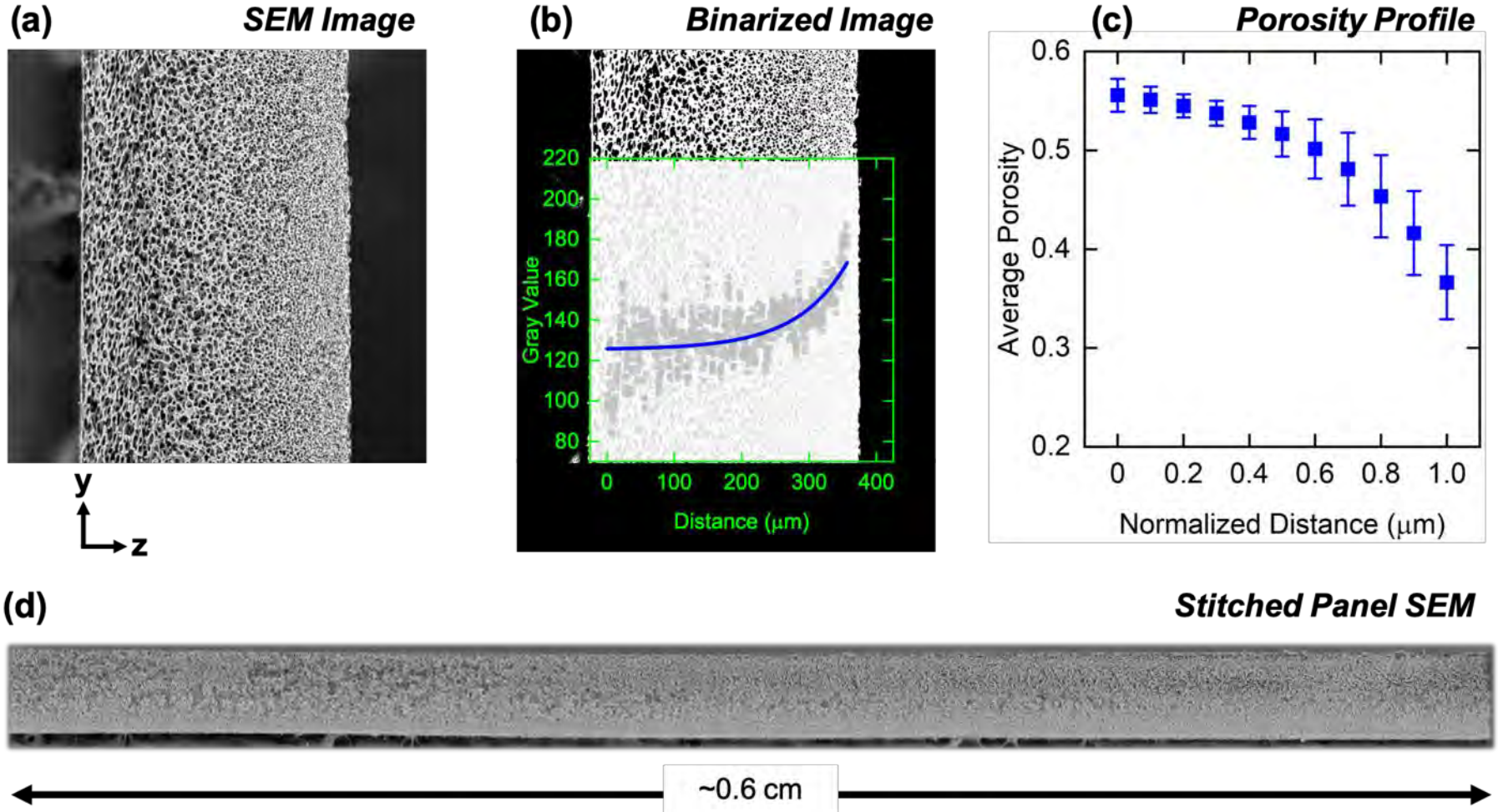
NIPS electrodes offer competitive all-vanadium RFBs performance



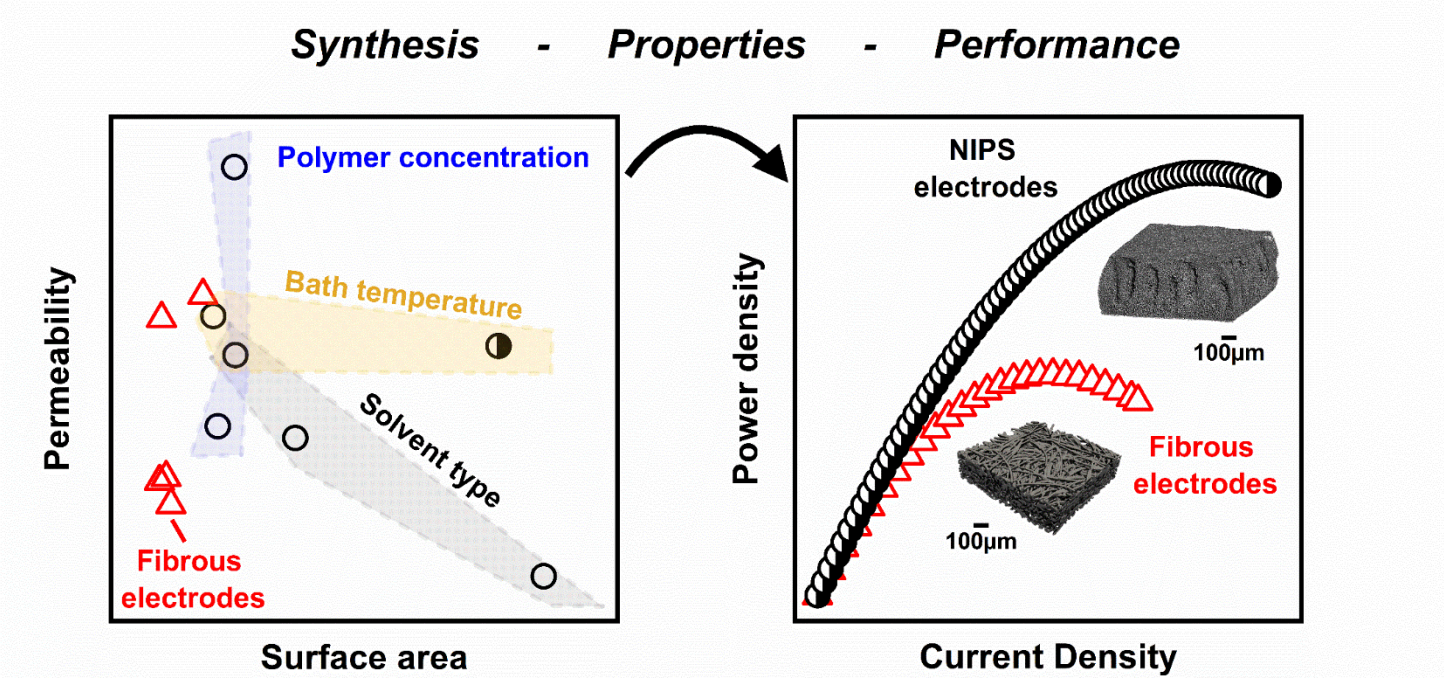


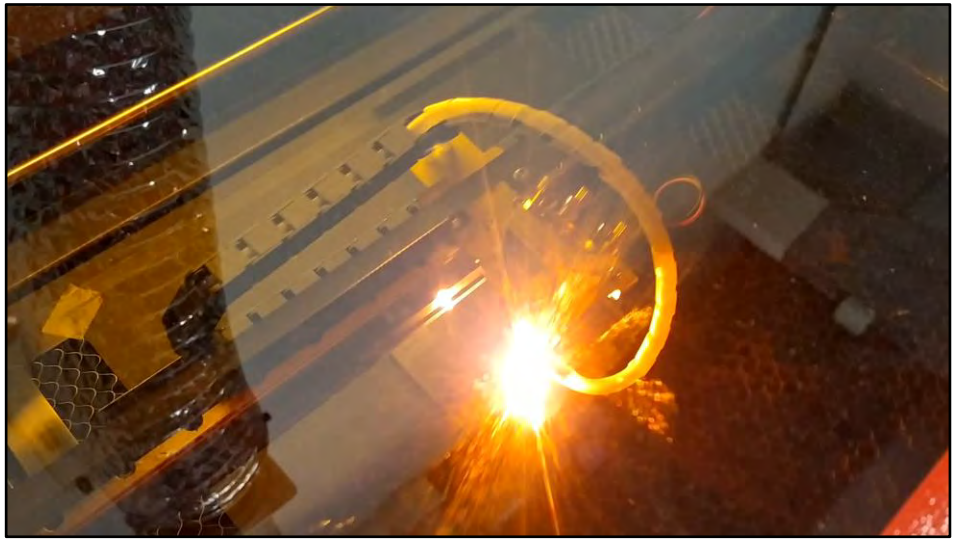
Jacquemond & Wan, *Cell Reports Physical Science* 2022, 3(7), 100943

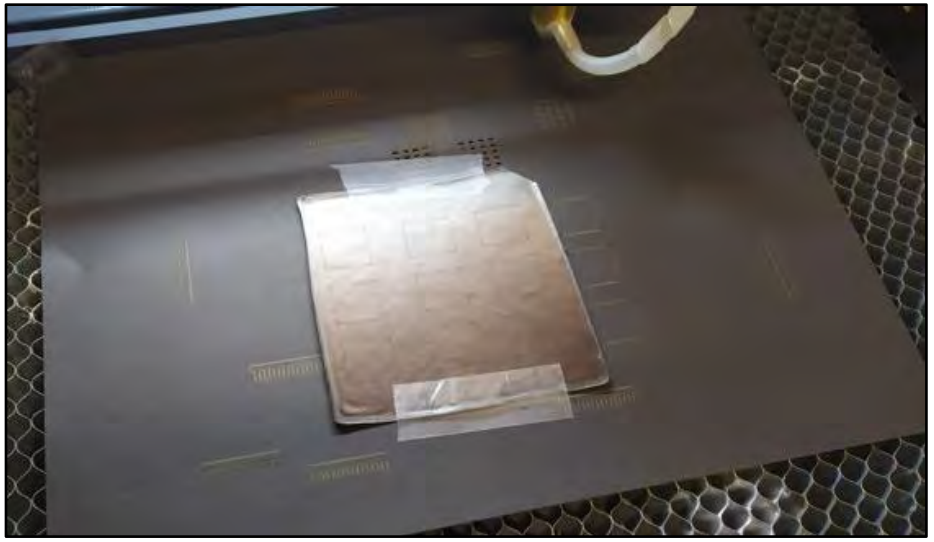
Porosity gradient electrodes



Wan & Jacquemond, *Energy Technology* 2023, in press







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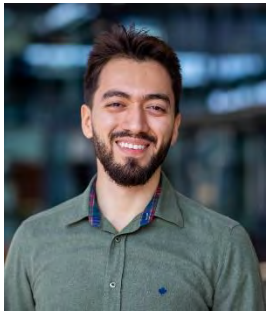
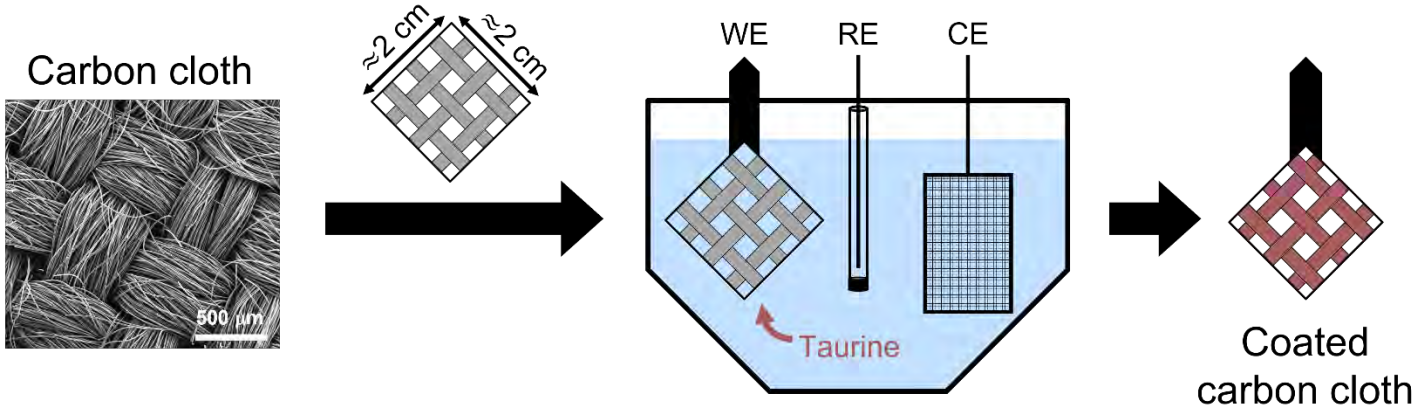
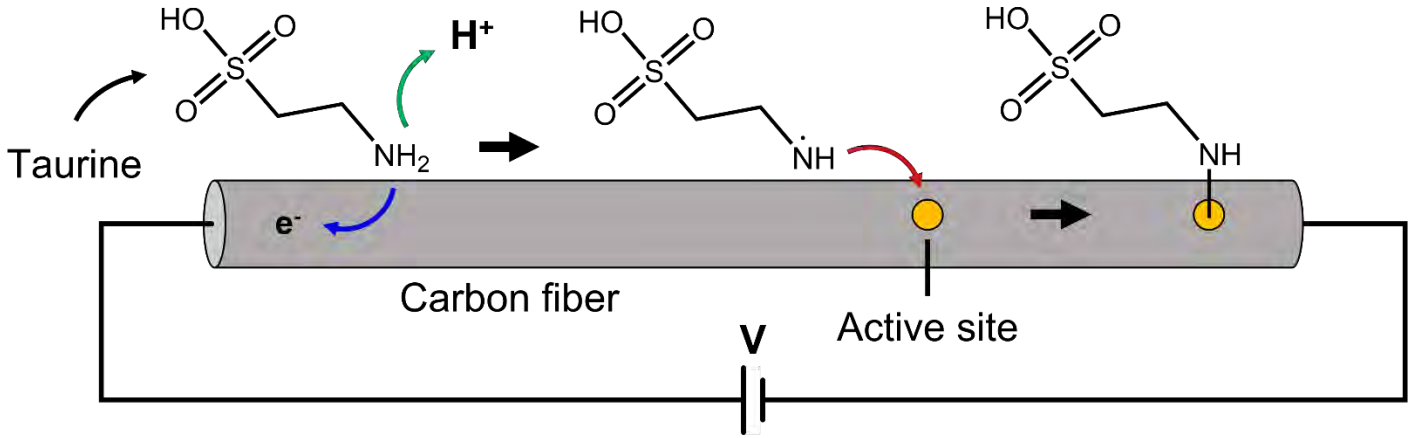
Can selected moieties on carbon electrodes impart improved kinetics and wettability?

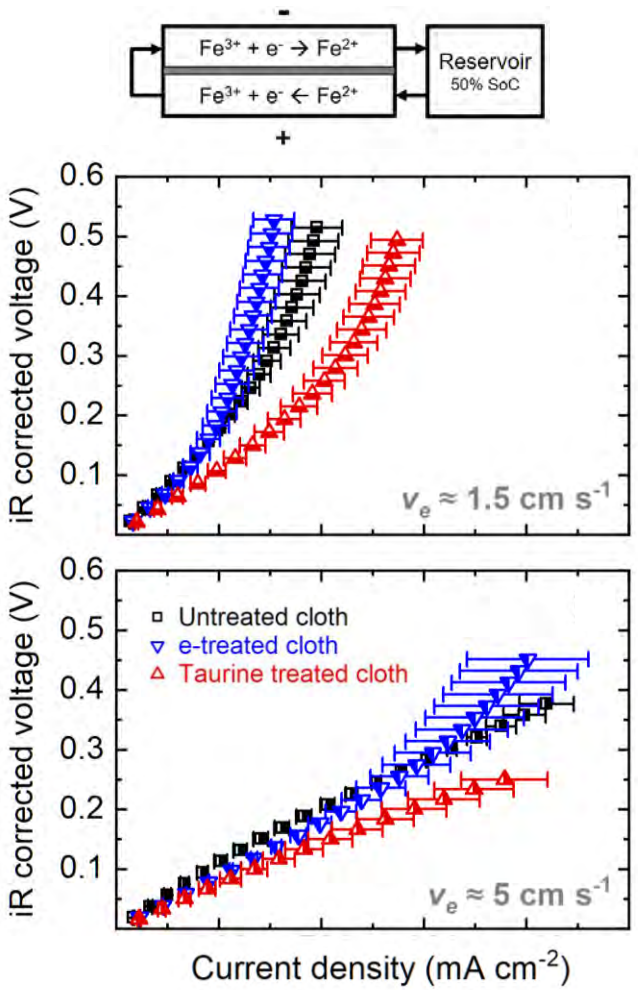


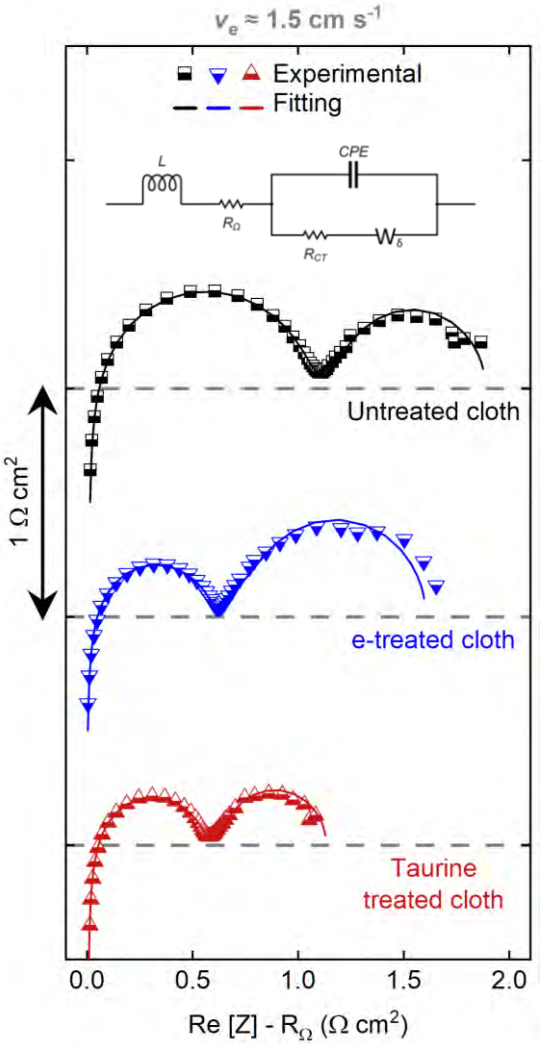




Boz, Boillat, and Forner-Cuenca, *ACS Applied Materials & Interfaces* (2022), 14, 37, 41883

Taurine-treated electrodes improve flow battery performance





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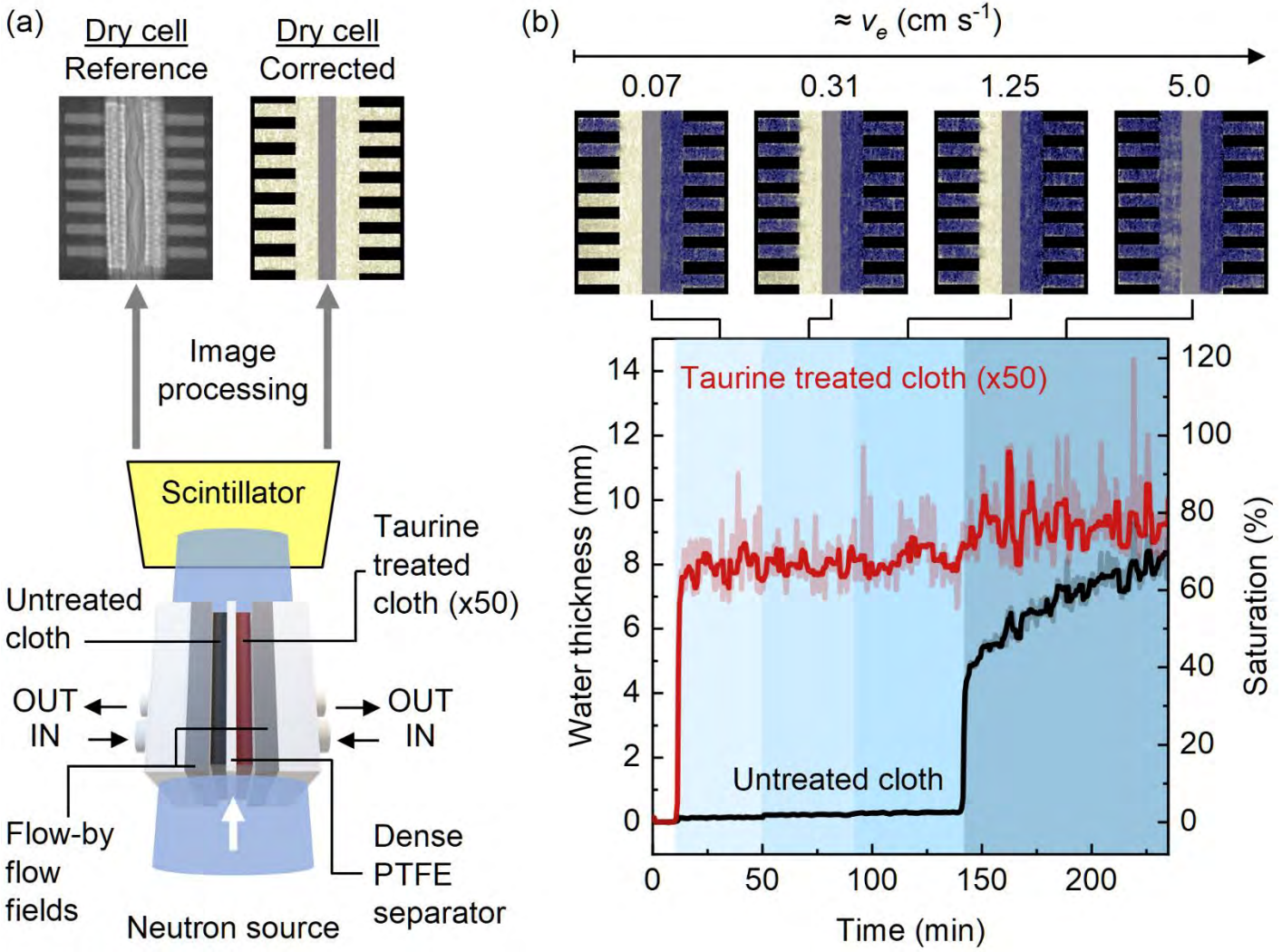
Neutron radiography unravels electrolyte distribution in-situ



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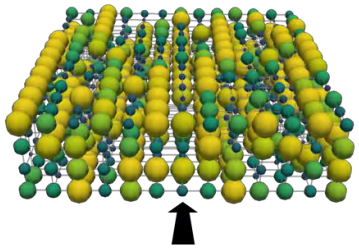
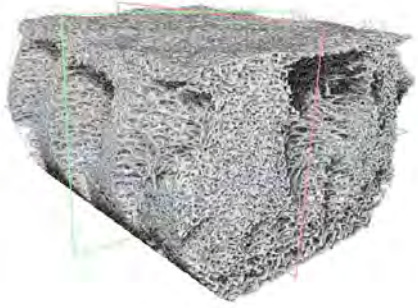
Take-home messages

- The porous electrode microstructure influences the performance of the electrochemical cell. Cloth electrodes provide a favorable suite of performance

- Pore-scale modeling can be deployed as a tool to guide experimental design of electrode microstructures



- Bottom-up synthesis of electrodes using phase separation of polymer solutions is a promising and facile method to control the 3D structure of the electrode.



- Electrografting is a versatile technique to conformally functionalize electrode surface to impact desired functional properties

Thanks for your attention!

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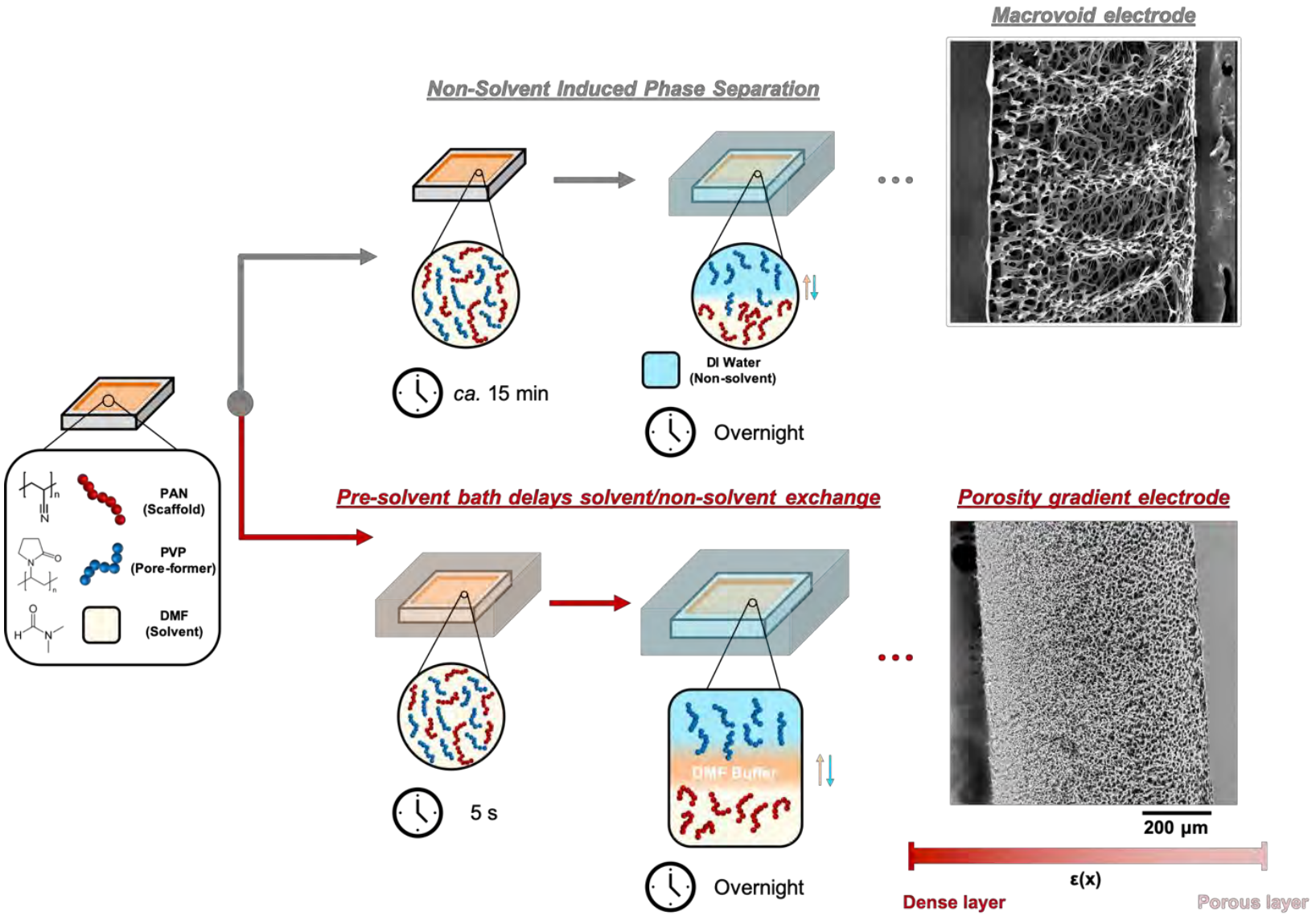
Porosity gradient electrodes



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