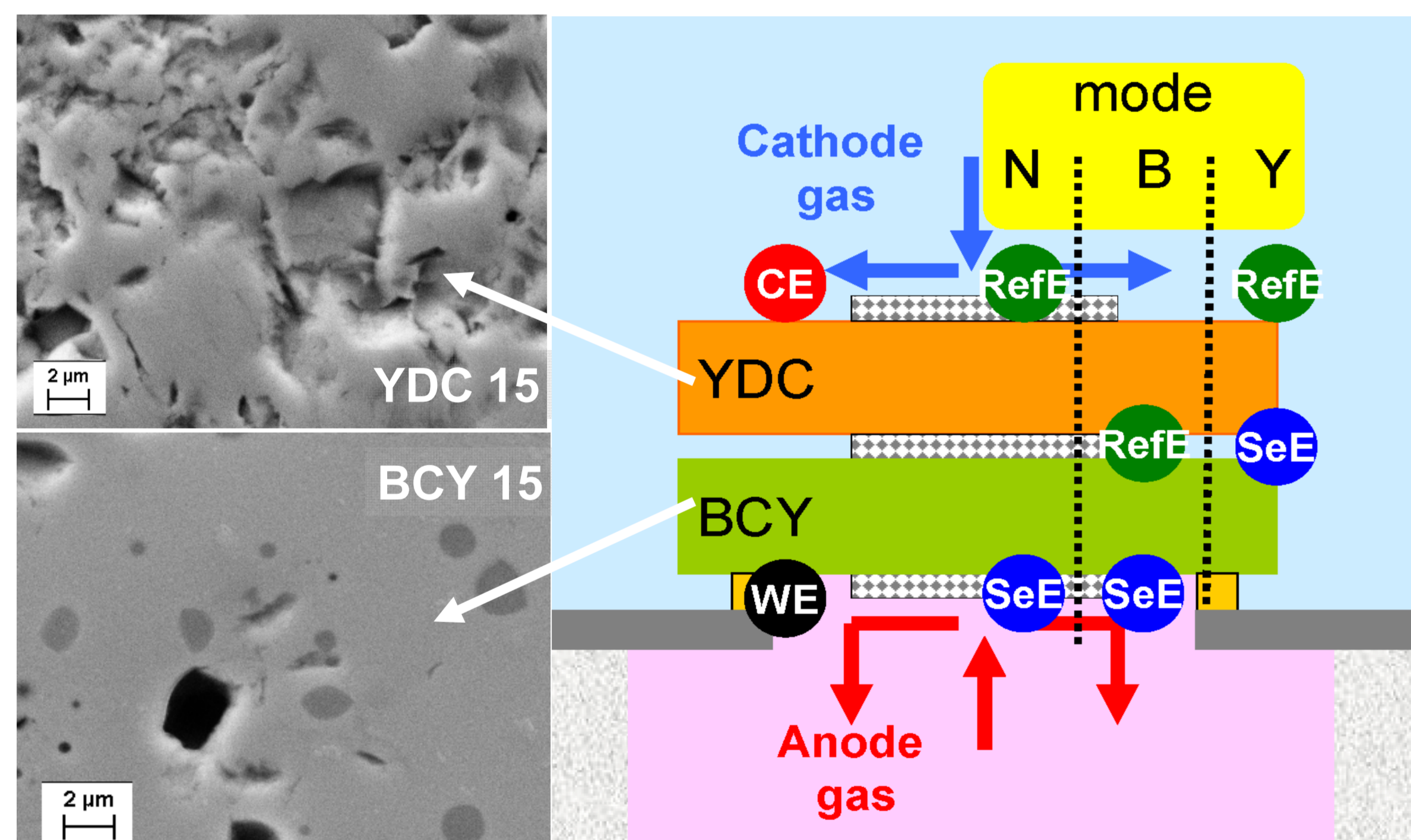


Dual Membrane Fuel Cell

Measurement set-up

- BCY15 ($\text{BaCe}_{0.85}\text{Y}_{0.15}\text{O}_{2.925}$) and YDC15 ($\text{Ce}_{0.85}\text{Y}_{0.15}\text{O}_{1.9}$) electrolytes contacted with platinum paste and mesh, replacing the composite ceramic CM
- pellets were fabricated via cold pressing and sintering at 1300°C / 4 h
- N, B and Y modes for voltage measurement
- WE and CE same, SeE and RefE change in each mode



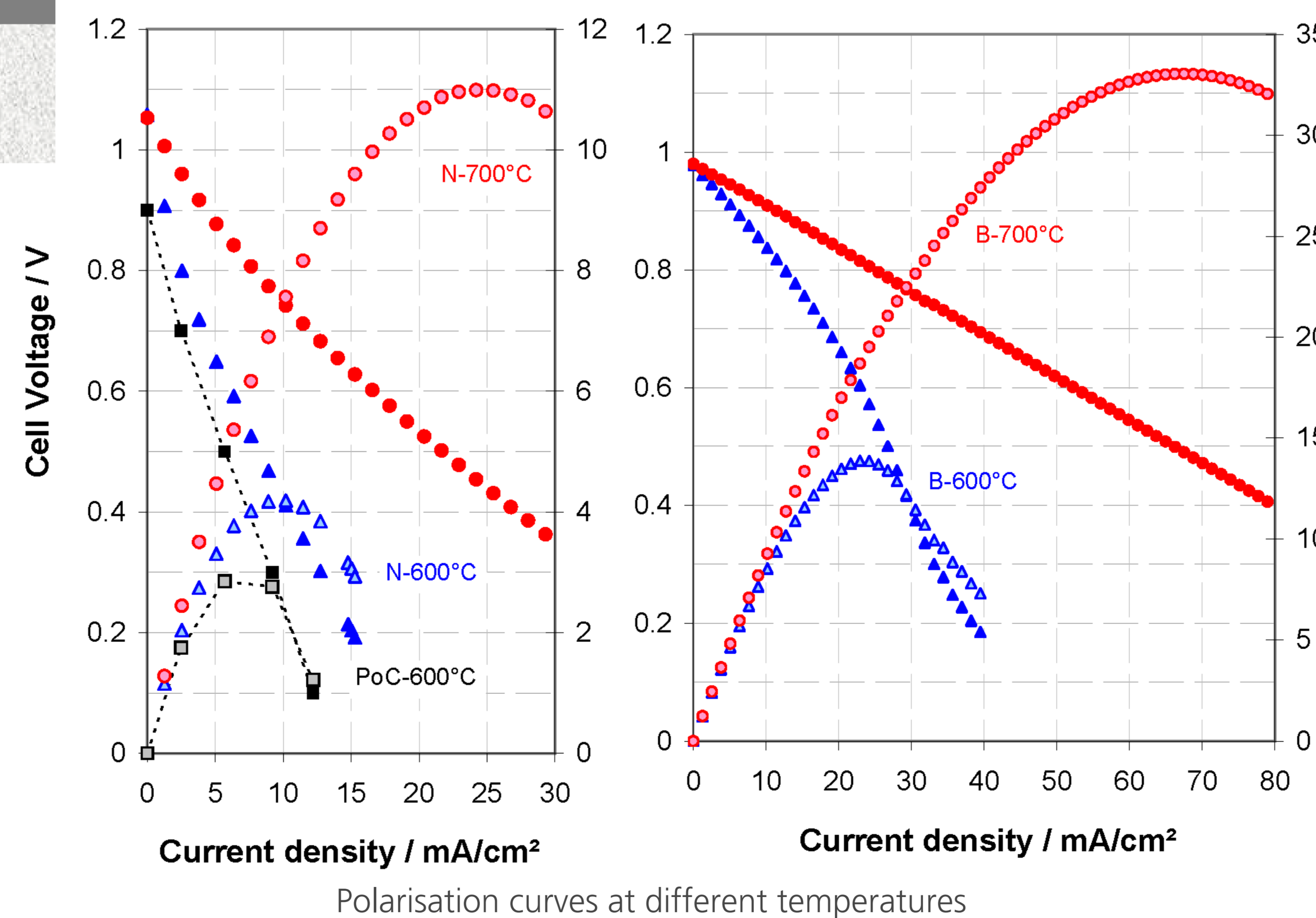
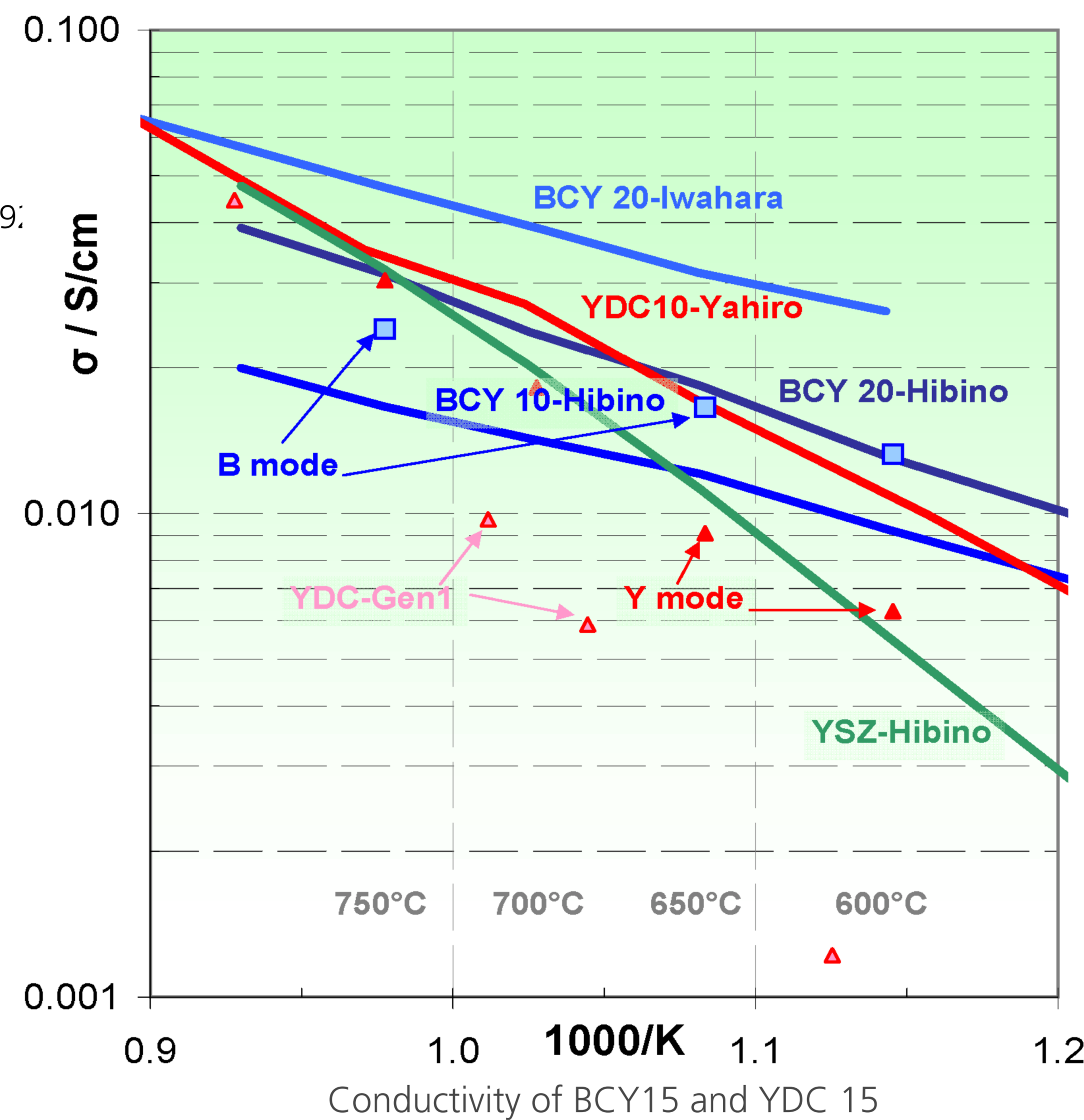
Micrograph of electrolytes

Electrode connections

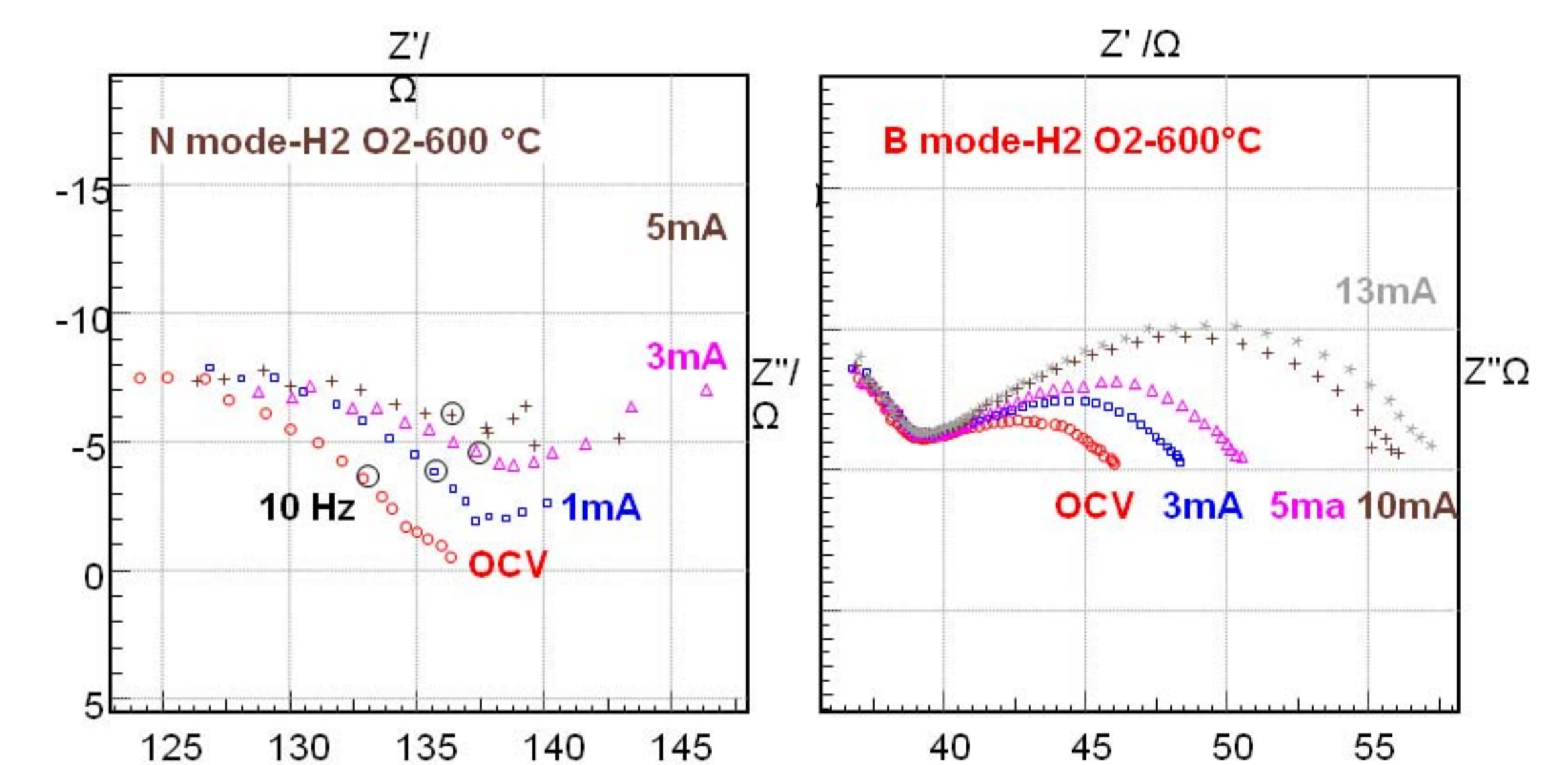
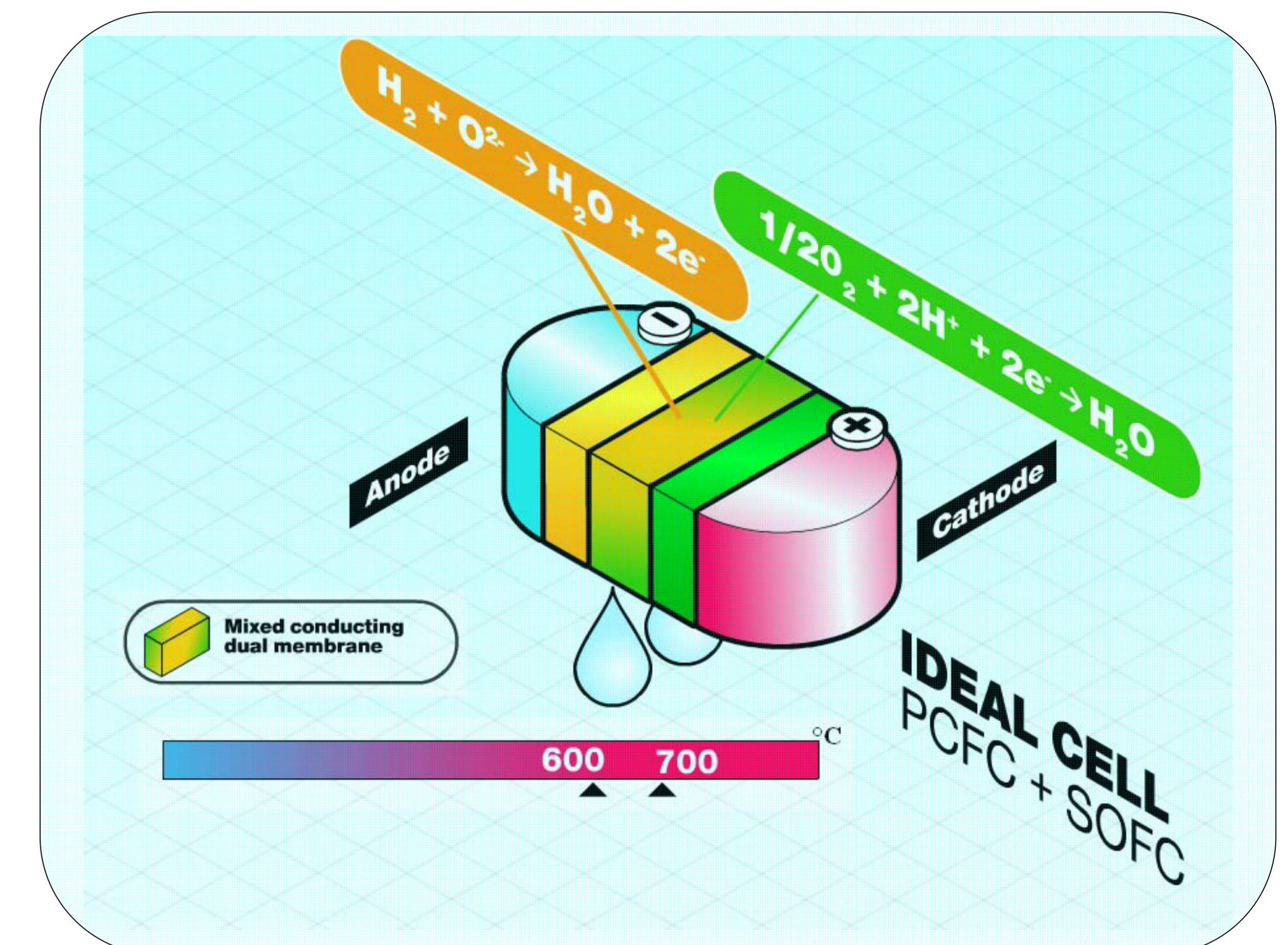
Results

- measured BCY 15 conductivity as expected
- low conductivity was measured for YDC15
- phase instability in BCY 15 observed
- improved performance compared to PoC
- insufficient gas lead to higher LF resistance for both N and b modes

PoC sample is an all ceramic dual cell tested for proof of concept



Polarisation curves at different temperatures



Complex impedance data at different electrical loading

Conclusion and Outlook

- stability and density of BCY15 should be improved
- measurements in 3 chamber set up
- H₂O vapor measurement in gas chambers
- plasma spraying and wet powder spraying will be used to fabricate full cells with thinner electrolytes