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## Motivation

✓ Standard electrode preparation of P2-NaMFC material

80%<sub>wt</sub> P2-NaMFC + 10%<sub>wt</sub> Carbon black + 10%<sub>wt</sub> Polyvinylidene fluoride (PVDF)

Mixed in **N-methyl-2-pyrrolidone (NMP)** under **Ar**

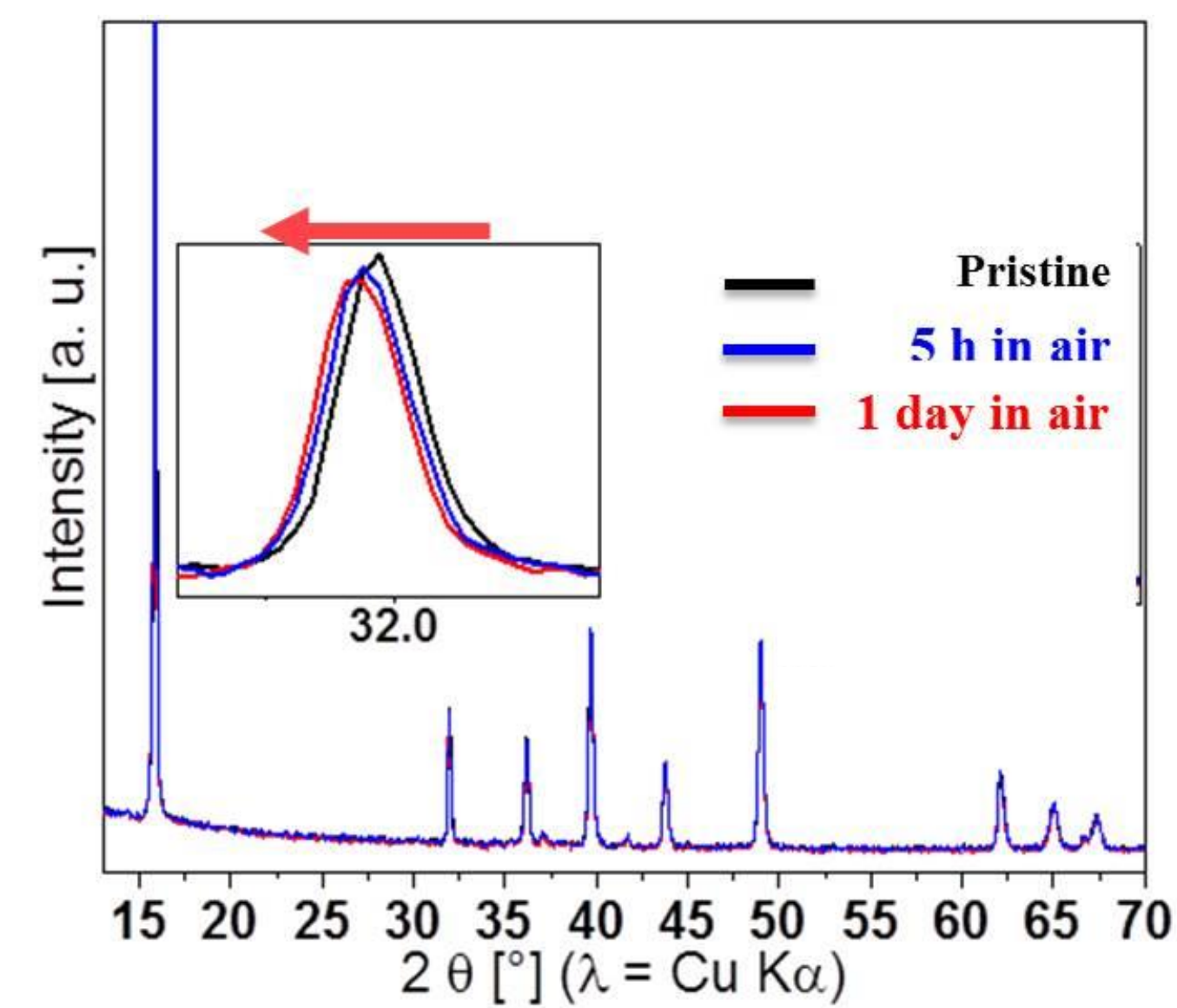


Investigations under **air**: - **water/CMC** (carboxymethylcellulose)

Goal → **safety + cost**

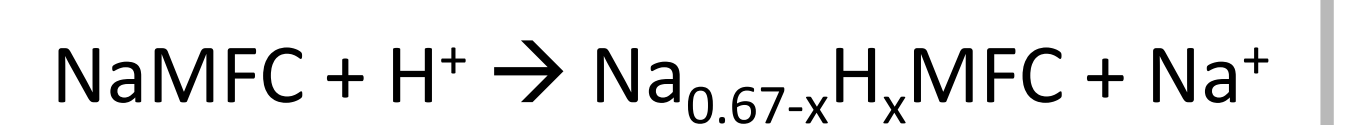
## First Observation

✓ XRD patterns on P2-NaMFC powder exposed to air



- Similar P2 structure
- Shift to lower angles for some peaks

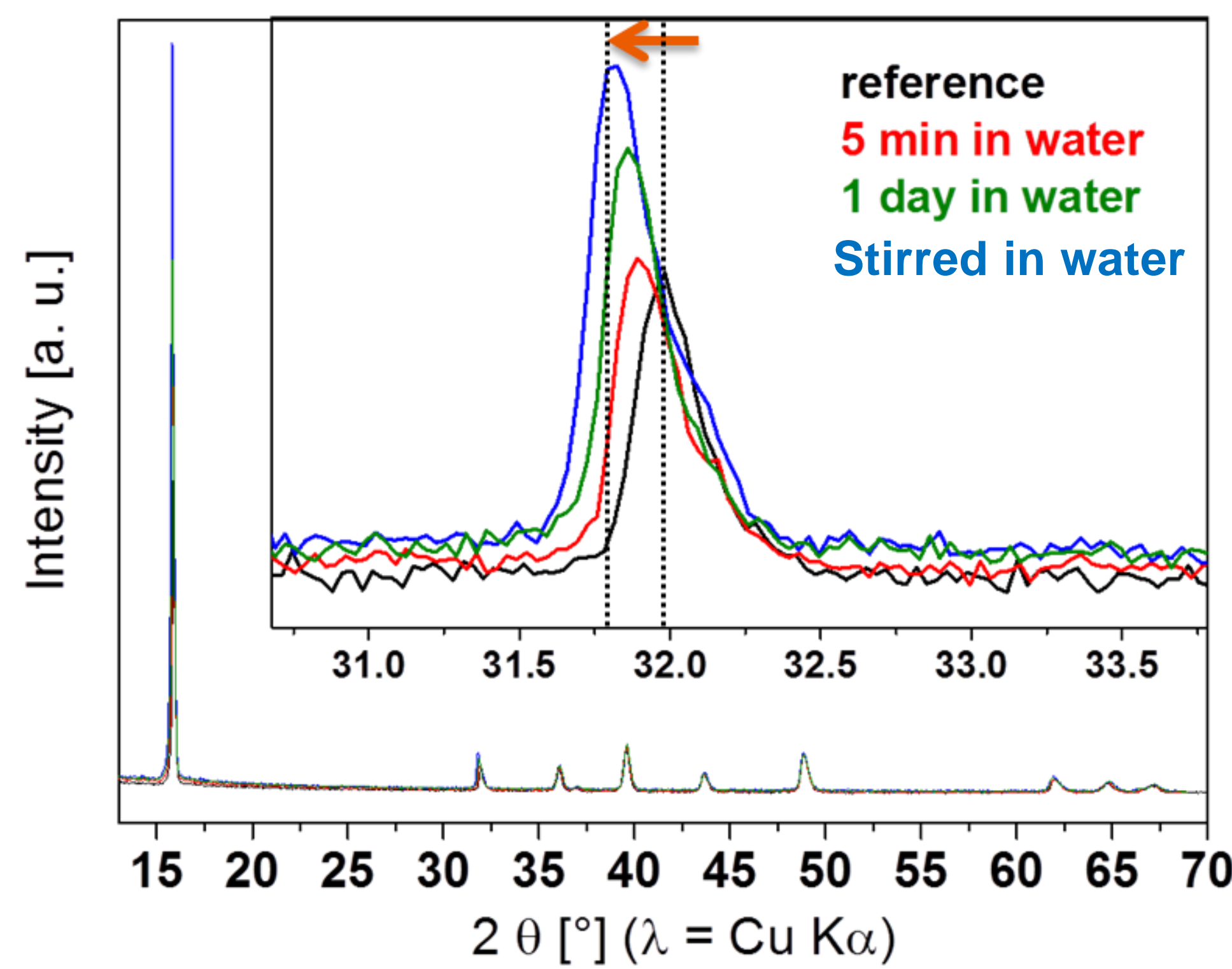
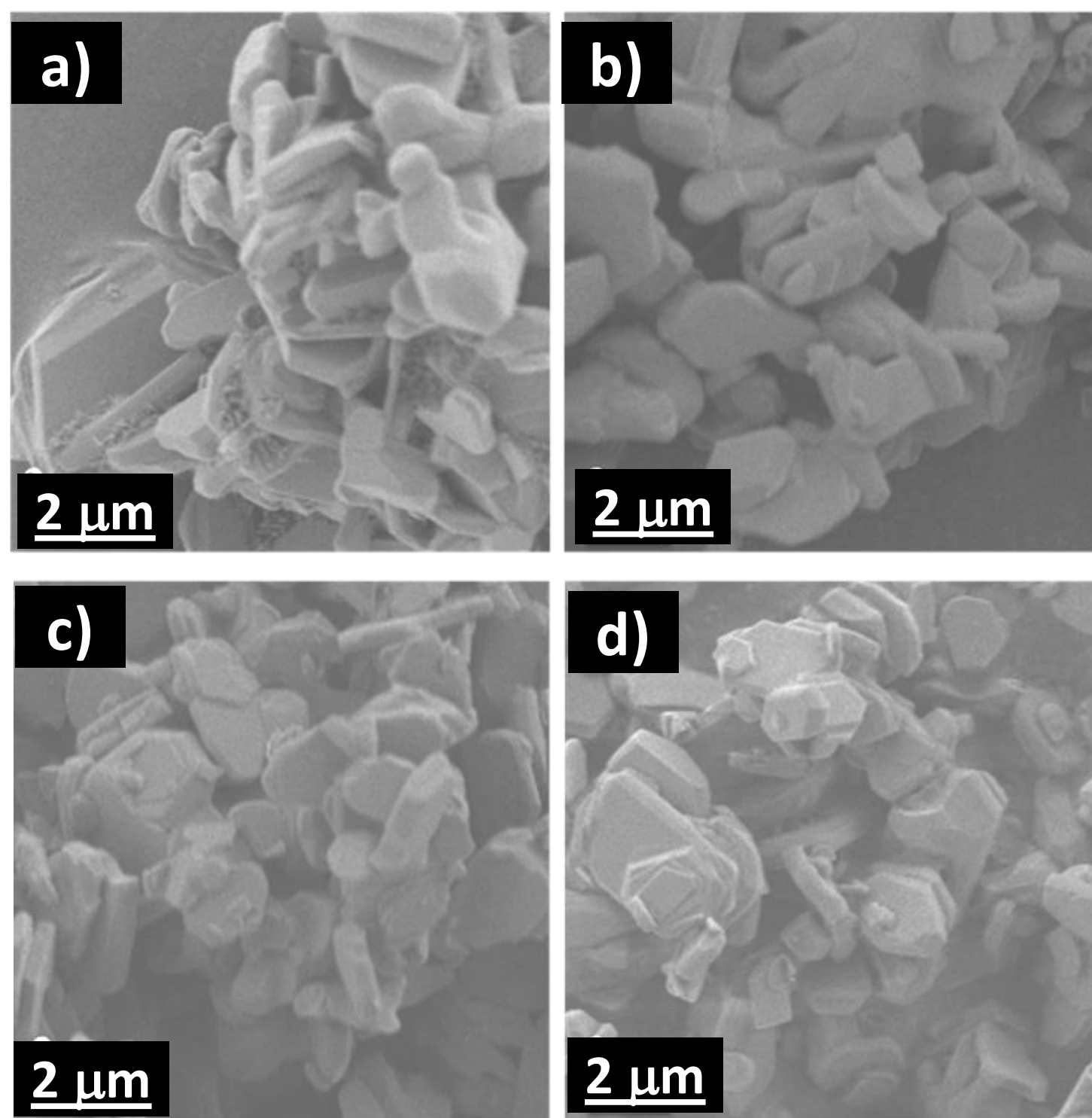
Desodiation?



## Stability of P2-NaMFC in water

✓ SEM pictures of P2-NaMFC soaked / stirred in water

✓ XRD patterns of P2-NaMFC in contact with water



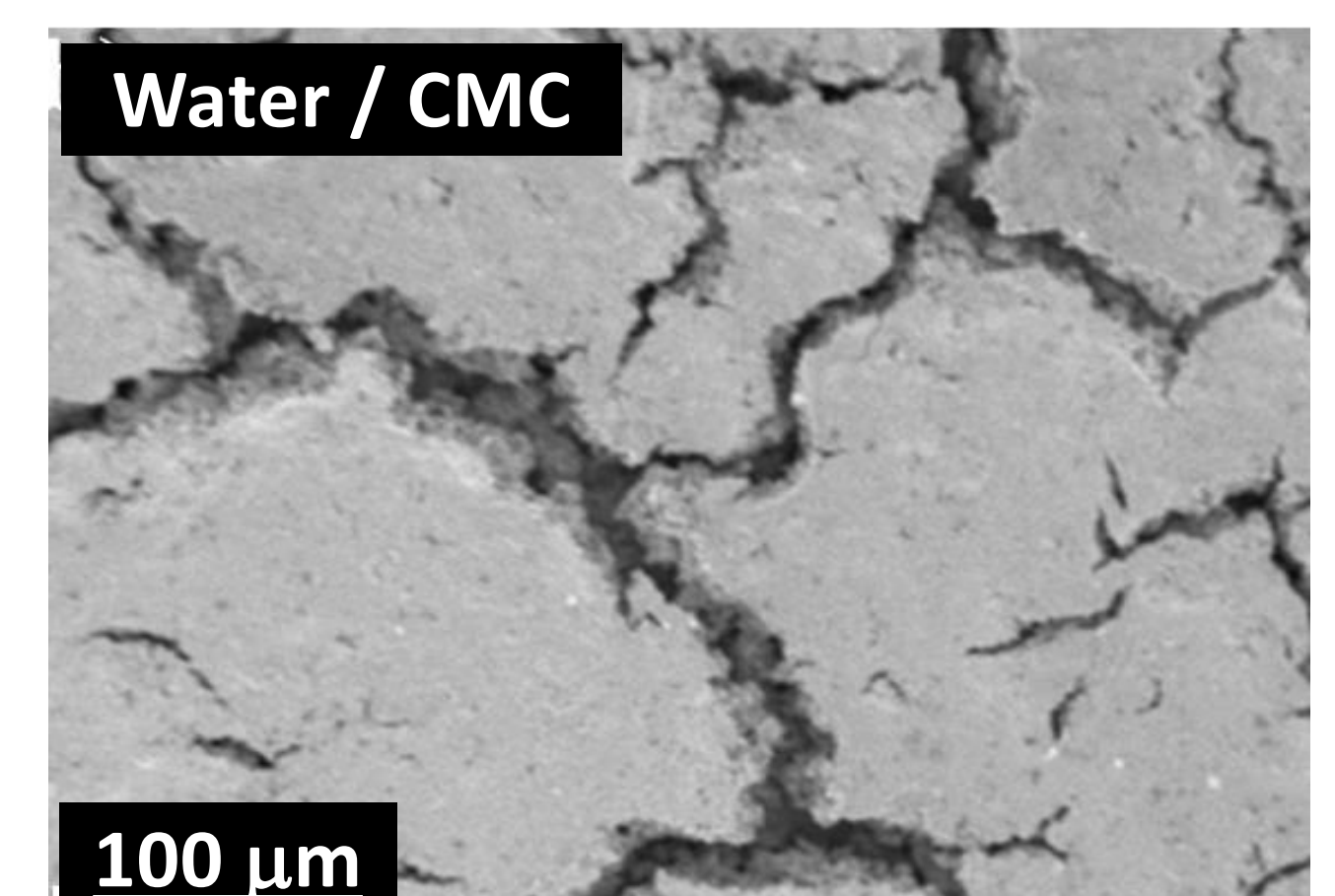
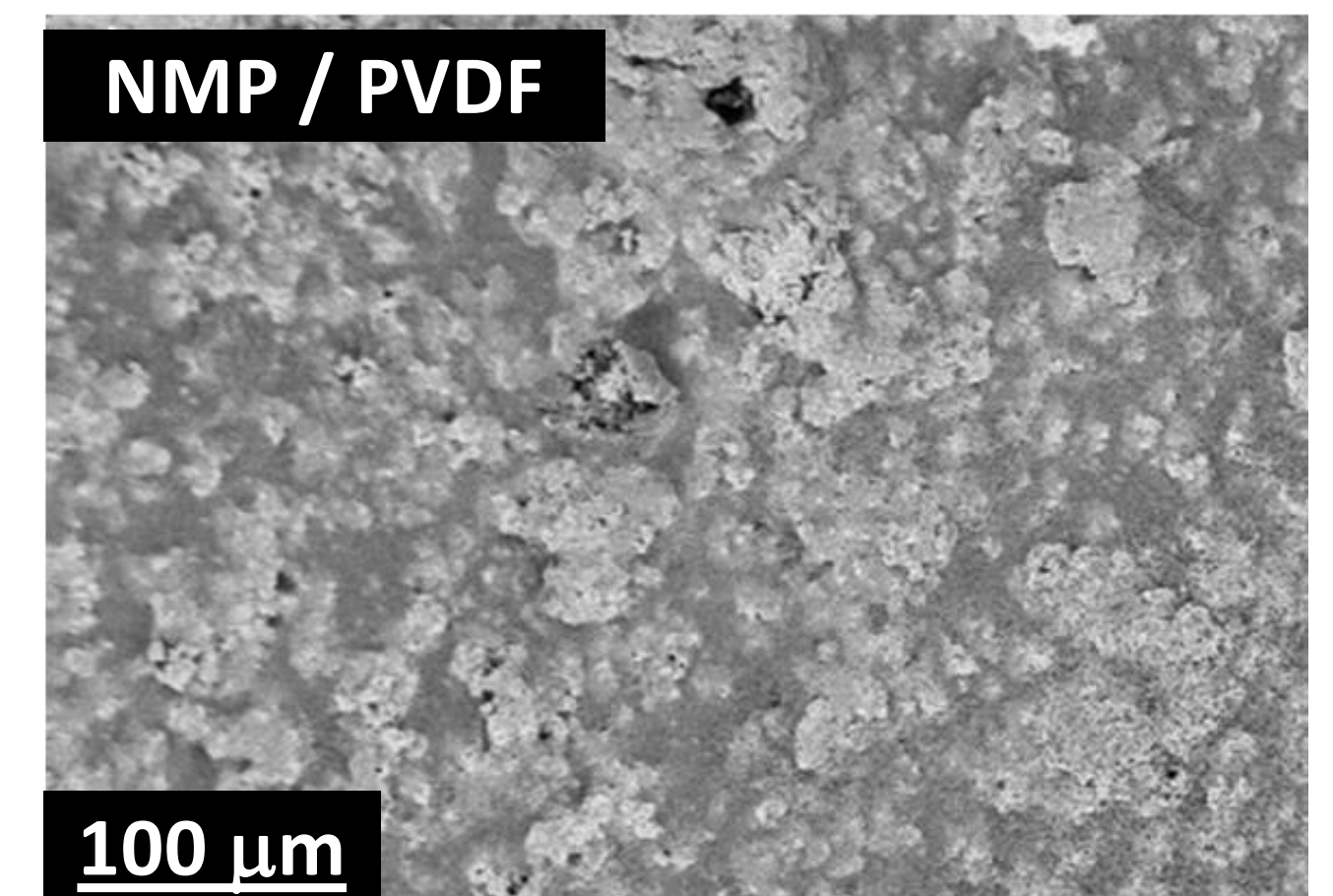
➤ No visible effect on the morphology

➤ P2 structure kept but important shift → **desodiation**

Desodiation evaluated at 10-15% by dosage ( $\text{Na } \%_{\text{at}} \rightarrow 0.57-0.6$ )

## Electrode engineering

✓ SEM pictures → Electrodes prepared with different solvents

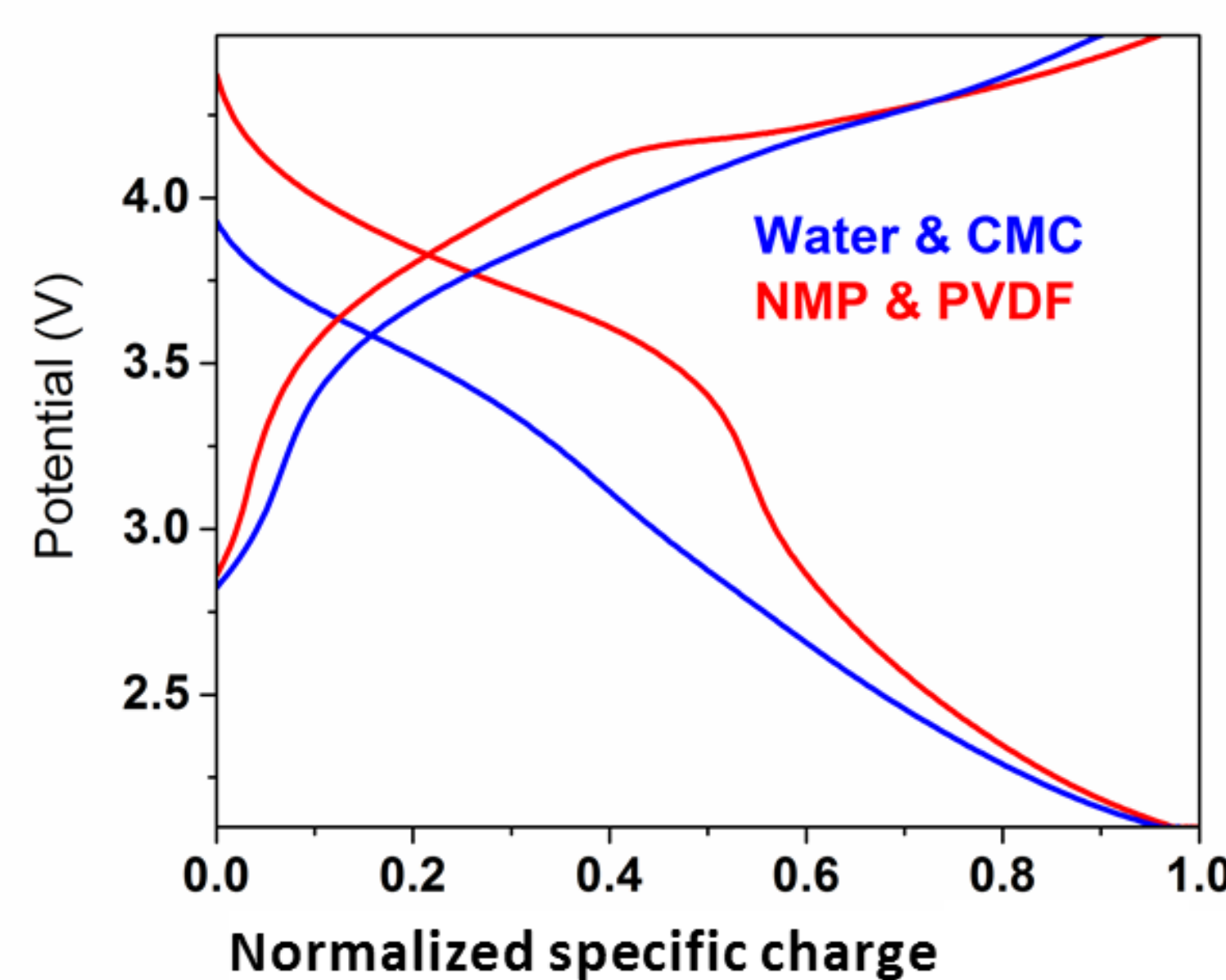
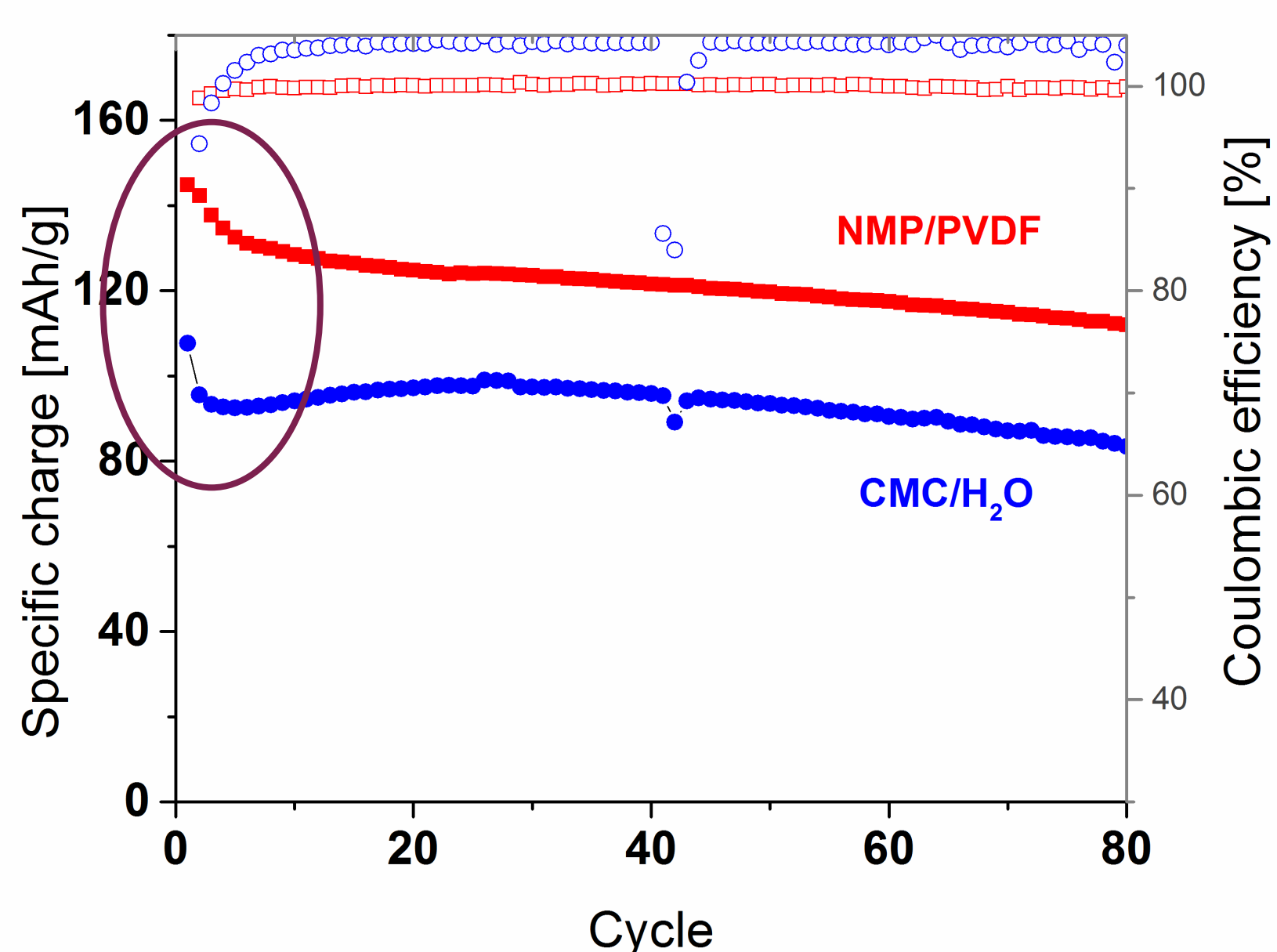


➤ Cracks with water/CMC

## Electrochemical performance

✓ Performance at C/10

✓ Galvanostatic curves (1<sup>st</sup> cycle)



➤ Lower performance for water / CMC

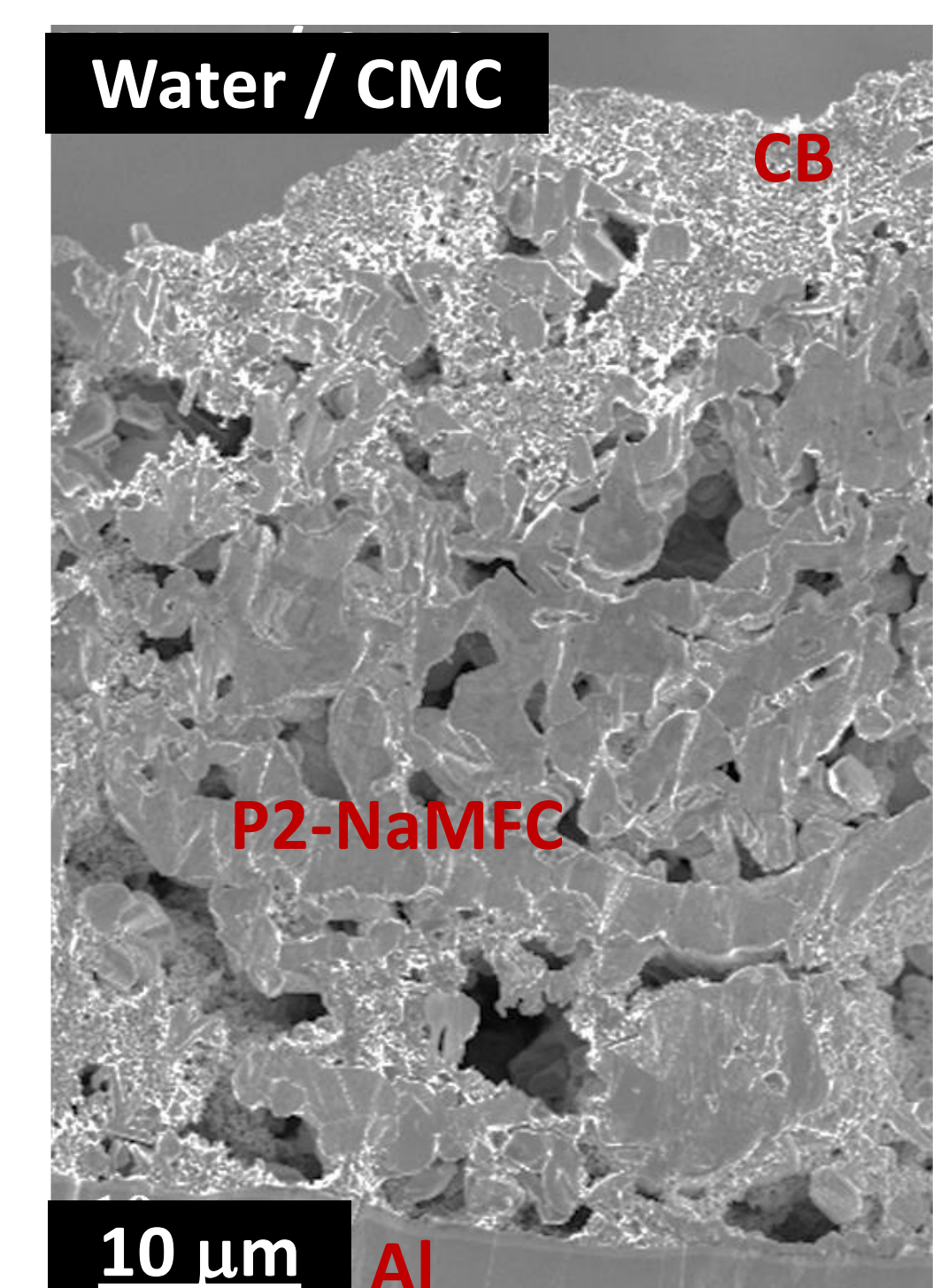
➤ No potential plateau for water / CMC

➤ Stable efficiency from 2<sup>nd</sup> cycle for water / CMC

Different reaction mechanism?

Influence of proton?

✓ SEM cross section view of water based electrode



➤ Carbon agglomeration @ surface

Need further optimization

## Conclusions

➤ Low stability of P2-NaMFC in water → desodiation of P2-NaMFC (10-15%) but no effect on morphology

➤ Performance of water based electrode → Lower but stable from 2<sup>nd</sup> cycle → Influence of proton?

