

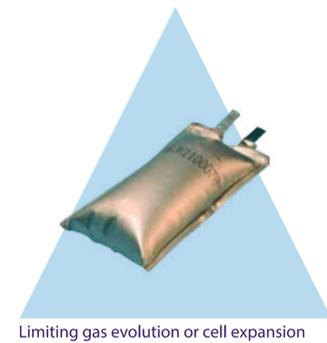
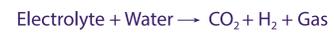
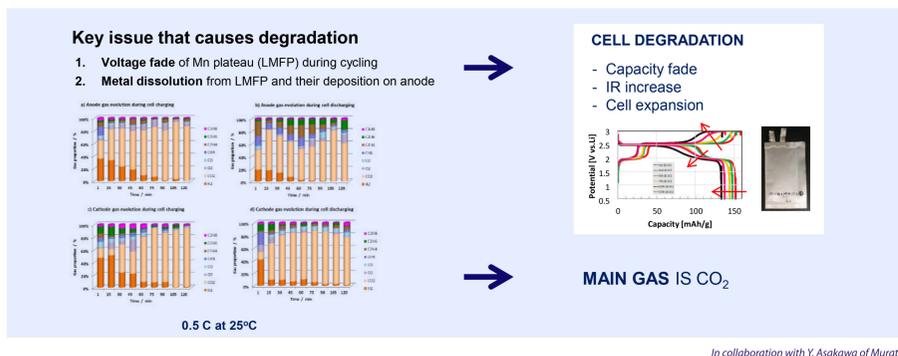
ADVANCED Li-ION TECHNOLOGIES: OLIVINE $\text{LiMn}_x\text{Fe}_{1-x}\text{PO}_4$ BASED BATTERIES

One of the promising approaches for limiting climate changes is to use alternatives and greener sources of energy (wind, solar, etc.). However, the production of electricity from these sources is fluctuant and need a solution for storage thus, the advent of energy storage for wind power, solar plant etc. requires a new generation of batteries. To do so, the development of a battery with high energy density, longer cycle life and safety is imperative.

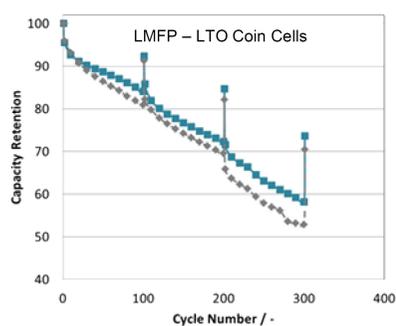
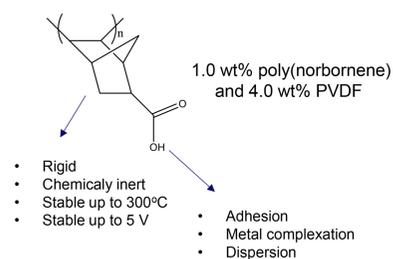
We describe here our efforts to develop a safe and long cycle-life LiMnFePO_4 (LMFP) / $\text{Li}_x\text{Ti}_5\text{O}_{12}$ (LTO) and LiMnFePO_4 (LMFP) / Graphite in 2 Ah pouch cells. Challenges were faced during this quest, a major one was the gas evolutions during cycling. The gas generated rose from many side reactions in conjunction with active materials during cycling. Therefore, we implemented different strategies of mitigation.

CHALLENGES USING LMFP AS CATHODE MATERIAL DEGRADATION ANALYSIS OF LMFP AND LTO CELLS

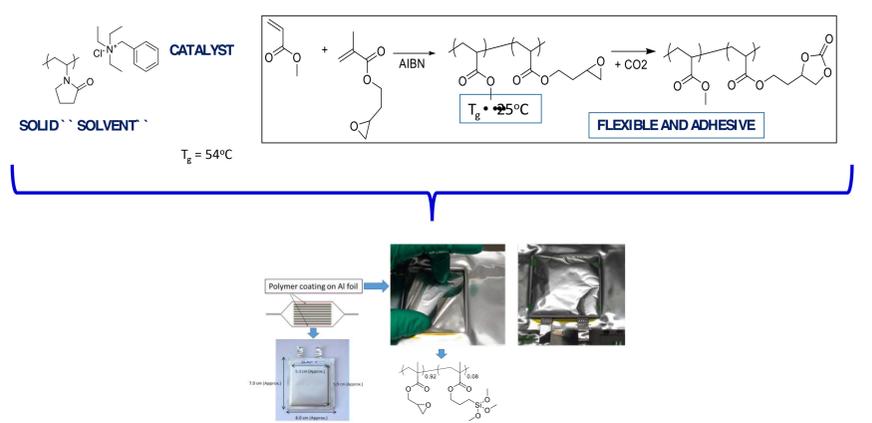
Degradation analysis has shown that LMFP has three main challenges.



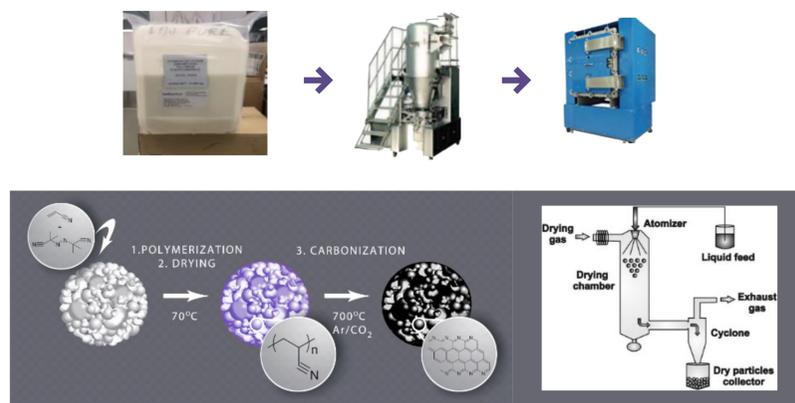
STRATEGIES FOR PREVENTING DEGRADATION AND CELLS EXPANSION POLY(NORBORNENE) AS CO-BINDER WITH PVDF



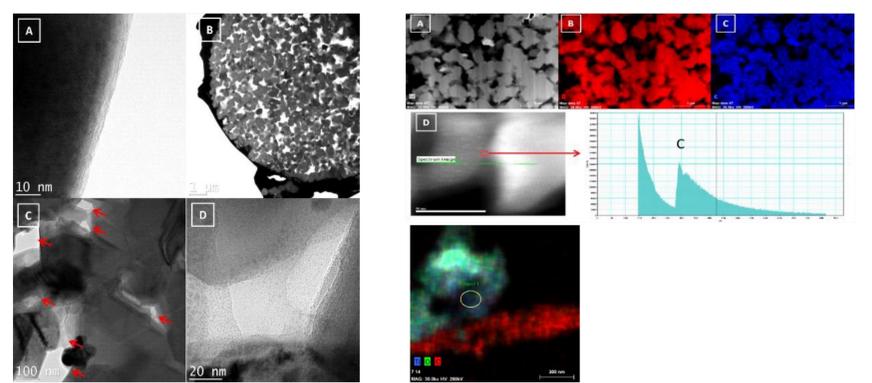
POLYMER SHEETS FOR TRAPPING CO_2 GAS



PROTECTION OF LTO PARTICLES BY COVERING WITH CONFORMAL CARBONS LARGE-SCALE PROCESS FOR CARBON-COATING LTO PARTICLES

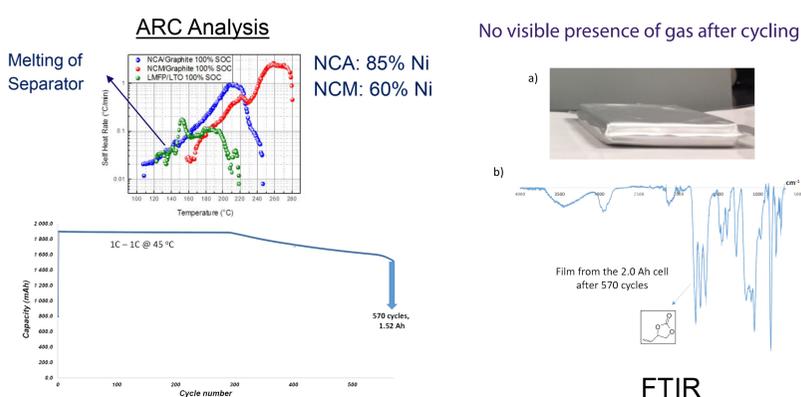


TEM ANALYSIS: COVERING EVERY PARTICLE

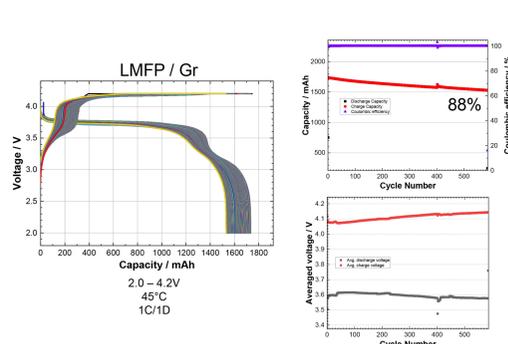


CYCLING AND CONCLUSION

2 AH CELL LMFP – LTO (3.0 V)



2 AH CELL LMFP – GRAPHITE



KEY POINTS

- Introducing Polymer as carbon dioxide trapping sheets
- Better performances and less gas evolutions using LTO carbon-coating
- PNBE as additive in binder
- 2 Ah Pouch Cells

