

LEPMI – Antenne Phelma Campus
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Chemical lithiation of modified NMC811 positive electrode material for high power density Li-ion batteries

Keywords: Electrochemistry, Li-ion battery, physical-chemical characterization, positive electrode material

What we offer

Fast charging limitations in lithium-ion batteries are known to be mainly due to slow transport mechanisms in the graphite negative electrode. Though engineering solutions have been proposed, the glass ceiling of the diffusive transport mechanism of lithium in graphite still constitutes the physical limitation behind the problem.

To solve it, isotopic lithium substitution has been proposed as a way of taking advantage of the higher diffusion coefficient of ^6Li compared to its more abundant counterpart, ^7Li . As the lithium source in commercial system is only provided by the positive electrode, our research efforts are focused on establishing a process to ^6Li enrich a commercial positive electrode material such as NMC811. The first is thus dealing with a chemical delithiation of a commercial NMC811 prior to be re-lithiated

We are offering an internship opportunity focused on the study of **wet chemical re-lithiation** of NMC811 and the comprehensive physico-chemical characterization of the resulting material. The intern will have the opportunity to learn and sharpen his/her characterization skills using a wide range of techniques and equipment.

The intern will, but not limited to:

- Optimize a wet-chemical re-lithiation protocol.
- Characterize the re-lithiated material using techniques such as **SEM**, **ICP-MS**, and **XRD**.
- Perform electrochemical characterizations (e.g., Swagelok or coin cells)
- Analyze and interpret experimental data and contribute to the presentation of results.

The internship will take place at the **LEPMI laboratory in Grenoble**, in collaboration with a major French industrial partner. It offers a unique opportunity to gain hands-on experience in battery materials research.

Who you are:

- Enrolled in a Master's degree (M1/M2 or 2A/3A) with a background in material science or chemistry
- Previous training in electrochemistry is an advantage

Duration: 4-6 months

Location: LEPMI laboratory on the INP-Phelma Campus in Saint Martin d'Hères (38)

Starting date: February 2026

To apply to this master thesis please send your CV and cover letter to Tom Mocellin (tom.mocellin@grenoble-inp.fr)