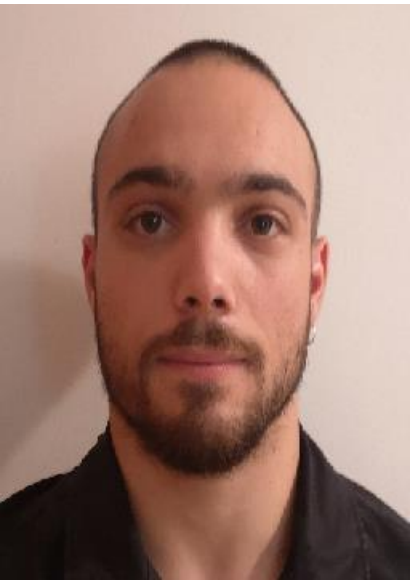

# ANDREA TREBBI

# CURRICULUM VITAE


Male

Date of birth: 20/03/1997

Italian

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## Career goal

I want to continue my experience and studies in the field of electrochemical energy storage systems, in particular batteries. I also would like to work with energy production systems. My ideal goal is to work for finding new and sustainable energy systems for a "green" future.

## Professional experience

**Graduate research**

**Master's degree**

LM-30 Energetic Engineering

**Activity carried out at:**

**CHEMICAL DEPARTMENT 'G. CIAMICIAN' – LABORATORY OF ELECTROCHEMISTRYOF MATERIALS FOR ENERGETICS (LEME)**

BOLOGNA (BO)

02/2023 - 06/2023

Hours: 350

**Thesis:** "Cobalt-free cathode for high voltage lithium-ion batteries"

**Supervisor:** Prof.ssa Francesca Soavi

**Co-supervisor:** Dott. Antunes Staffolani

Dott. Daniele Marchese (MIDAC)

**Main activities and responsibilities:**

During the internship I have compared the electrochemical properties of LMNO-based cathodes in half cells LMNO/Li with different mass formulation and different PVDF provider. The study aimed to provide a good benchmark for MIDAC S.p.A. for the comparison of the new cathodes that will be developed and/or for the novel electrolytes that will be formulated to improve cycling performance for LMNO-cathodes.

**Acquired skills:**

- Correct use of the Argon filled glove box.
- Ability in cell assembly with various designs, Swagelock and EL-Cell cells.

- Skill in using VSP galvanostat/potentiostat with dedicated software (EClab), used for electrochemical protocol management and data analysis.
- Skill in performing electrochemical techniques such as Cyclic Voltammetry (CV) and galvanostatic charge and discharge (GCPL)
- Manufacturing of LIB cathodes.

**Objectives achieved:**

The manufacturing processes for LMNO-based cathodes was successfully developed. A better understanding of the lithium-ion battery functioning and principles.

**Professional goals:**

In addition to the scientific objectives achieved and the specific skills obtained, I have analyzed how the cathode manufacturing process influence the electrochemical properties and, also, how to organize the research work.

**Undergraduate Internship**

**Bachelor's degree**

LM-9 Energetic Engineering

**Activity carried out at:**
**ENEA – Centro Ricerca di Bologna**

Bologna (BO)

10/2019 - 03/2020

**Thesis:** "Applicazione di cool materials: analisi sui consumi energetici di un centro commerciale e mitigazione dell'isola di calore urbana"

**Supervisor:** Prof. Gian Luca Morini

**ENEA tutor:** Ing. Maria-Anna Segreto

**Main activities and responsibilities:**

Study of energy consumption of a large building complex in function of the mitigation of heat via application of cool materials with DesignBuilder software. Moreover, I studied the effects of those materials on the urban heat island that generates around city buildings with ENVI-met software.

**Acquired skills:**

During my internship I learned how to use two different software for energetic analysis, DesignBuilder and ENVI-met, for modelling and simulating the energy behaviour of buildings. Also, I have studied how to project air treatment units and better understood how their work.

**Objectives achieved:**

My work demonstrated that applying cool materials on the external surface of building in areas where the annual medium temperature in

quite high significantly reduce the total energy consumption of the building.

**Professional goals:**

In addition to the objectives achieved and the specific skills obtained, through the articles study and the work I was also able to deepen the topic concerning air treatments units.

## Education

**MSc in Energetic Engineering (LM-30 – INGEGNERIA ENERGETICA E NUCLEARE)**

Alma Mater Studorum – Università di Bologna

**Final mark:** 106/110

**Thesis:** "Cobalt-free cathode for high voltage lithium-ion batteries"

**Thesis subject:** Electrochemical energy storage devices

**Supervisor:** Prof.ssa Francesca Soavi

**Co-supervisor:** Dott. Antunes Staffolani

Dott. Daniele Marchese (MIDAC)

**Future of the thesis work:** the thesis results will be used as preliminary study for MIDAC S.p.A. for the development of recycled electrode based on transition metal oxide.

**BSc in Energetic Engineering (L-9 – INGEGNERIA INDUSTRIALE)**

Alma Mater Studorum – Università di Bologna

**Final mark:** 93/110

**Thesis:** "Applicazione di cool materials: analisi sui consumi energetici di un centro commerciale e mitigazione dell'isola di calore urbana"

**Thesis subject:** Impianti tecnici T

**Supervisor:** Prof. Gian Luca Morini

**ENEA tutor:** Ing. Maria-Anna Segreto

**High School Diploma, Mechanical Expert**

Istituto d'istruzione superiore "Odone Belluzzi", Bologna (BO)

**Final mark:** 89/100.

# Personal skills

## Professional skills

- Use of the argon filled glove box.
- Ability in cell assembly with various designs, Swagelock and EL-Cell cells.
- Skill in using VSP galvanostat/potentiostat with dedicated software (EClab), used for electrochemical protocol management and data analysis.
- Skill in performing electrochemical techniques such as Cyclic Voltammetry (CV) and galvanostatic charge and discharge (GCD).
- Application of analysis procedures, experimental protocols and adaptation to the desired function, processing of scientific data collected with specific programs.
- Research of scientific literature used to produce reports and elaborated and to take inspiration for my work.

## Language skills

Mother tongue: Italian

Other languages: English (B2)

## Software skills

- Microsoft office tools
- Design Builder
- ENVI-Met
- Autocad
- SolidWorks
- Origin
- EClab software
- MATHLAB (basic)
- C++ code language (basic)

## Previous experience

- I work as Calisthenics Coach in “PoleDance San Lazzaro” gym from 2020 till now.
- I occasionally worked as Security for “SIGMA srl” in different night clubs in Bologna since 2021 till July 2023.
- AVIS volunteer since 2015.

## Driving license certificate (B)

Dr. Daniele Marchese
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Verona 21/07/2023

To Whom It May Concern,

I am writing this letter to recommend Andrea Trebbi for his excellent work on preparation and electrochemical characterization on LMNO-based cathodes, a cutting-edge technology in the field of lithium-ion batteries that is of fundamental importance to achieve high energy density. As R&D Chemist in charge of LMNO cell development at MIDAC S.p.A., I witnessed and collaborated with Andrea on his research activity for the thesis internship.

Andrea got his master degree (106/110) on July 2023 with the thesis "Cobalt-free cathode for high voltage lithium-ion batteries" under the supervision of Prof.ssa Francesca Soavi and in collaboration with our company, MIDAC, at the Laboratory of Electrochemistry of Materials for Energetics, Dept. of Chemistry "Giacomo Ciamician", Alma Mater Studiorum – University of Bologna. His research was part of a collaborative project set between MIDAC, partner of the IPCEI EuBatIn, program and GISEL-INSTM, and within the PNRR Project.

Through his research, Andrea has excelled both in deep understanding of the principles governing the electrochemical behavior of LMNO-based cathodes and in his keen ability in design and optimization of different cathodes compositions and electrochemical cells. His remarkable work will be used as the benchmark for the future R&D work at MIDAC SpA in regards of the ambitious objectives of IPCEI EuBatIn program.

Aside from his technical accomplishment, Andrea's excellent work, has proven him to be a truly passionate energy engineer with a very keen eye for research world as a way to contribute to the future challenges on sustainability and energy decarbonized production, which has led him to be comfortable in a chemical laboratory. Moreover, Andrea has demonstrated an outstanding autonomy and was able to proficiently work in group and to interact with other researchers. I would be glad to give more details whenever requested,

Sincerely,

Dr. Daniele Marchese D
R &D Chemist, Lithium Batteries

Bologna, 24/07/2023

*Signature*