



Emanuele Manzi

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ABOUT ME

PhD student in Polymers Science at the University of Bologna, Department of Industrial Chemistry

EDUCATION AND TRAINING

01/11/2023 – CURRENT BOLOGNA

PHD STUDENT Alma Mater Studiorum - University of Bologna - Department of Industrial Chemistry

The research project focuses on the development of nanofibrous systems for structural and functional modification of composite materials for lightweighting, performance, safety and durability improvement. The pursued goal stands in the enhancement of CFRPs properties for reducing their intrinsic weaknesses, including delamination, through reinforcing mechanisms that involve the use of polymeric materials, mostly in nanoscale size. Exploiting their unique features, improved performance can be achieved while ensuring lightness and tunability, in addition to the possibility to incorporate them only in stress concentration points, avoiding material waste.

Field of study Composites and material science

18/10/2021 – 19/10/2023 BOLOGNA

MASTER DEGREE IN LOW CARBON TECHNOLOGIES AND SUSTAINABLE CHEMISTRY Alma Mater Studiorum - University of Bologna - Department of Industrial Chemistry

The presearch project of the experimental thesis focuses on enhancing the properties of Carbon Fiber Reinforced Polymer (CFRP) laminates, in order to make them even more useful in the pursuit of the ecological transition through lightweighting in green mobility. The main goal is to increase their performance, safety and durability, ensuring higher application range for structural purposes. To address the inherent delamination weakness in CFRP laminates, rubbery nanofiber mats are developed using Nitrile Butadiene Rubber (NBR) and polyethylene oxide (PEO), in order to increase their interlaminar fracture toughness. Tests, including TGA, DSC, tensile, flexural, and delamination tests, are conducted on NBR/PEO nanofibrous mats and rubbery-modified CFRPs.

Field of study Industrial Chemistry | **Final grade** 110 With Honours | **Type of credits** ECTS | **Number of credits** 120 |

Thesis Electrospun rubbery nanofibers: effect of crosslinking on their morphology and properties

01/10/2018 – 10/12/2021 BOLOGNA

BACHELOR DEGREE IN INDUSTRIAL CHEMISTRY Alma Mater Studiorum - University of Bologna - Department of Industrial Chemistry

This preliminary study is focused on an elemental analysis of several samples of different grains' flour, including various typologies of refined product, researching transition metals and trace elements. The final aim is to create a large database, with a high data bank and easily enlargeable, in order to have enough data to analyze unknown flours and to set up traceability analysis. Traceability is the ability to know some or every information about the considered product, across the entire productive cycle. Studies on food traceability are on a high interest level in scientific world, and the number of publications on this topic on a global scale is constantly increasing.

The purpose of this work is to find some trends of analyzed elements in function of different parameters, such as refining degree or geographical origin, also with a statistical point of view.

Field of study Industrial Chemistry | **Final grade** 108/110 | **Type of credits** ECTS | **Number of credits** 180 |

Thesis Multi-elemental analysis of commercial flours of different cereals by ICP-MS QQQ

Final grade 100/100

LANGUAGE SKILLSMother tongue(s): **ITALIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH (CAMBRIDGE ENGLISH CERTIFICATION)	C1	C1	C1	C1	C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

SELF DECLARATION OF OTHER LANGUAGE**SPANISH: Self declared B2 level in reading, listening and speaking****CONFERENCES AND SEMINARS**

02/07/2024 – 05/07/2024 Nantes, France

ECCM21 - 21st European Conference on Composite Materials

Oral Communication as a speaker:

- Emanuele Manzi, Pietro Braga, Giulia Lucarini, Emanuele Maccaferri, Laura Mazzocchetti, Tiziana Benelli, Tommaso Maria Brugo, Andrea Zucchelli, Loris Giorgini; *Electrospun thermoplastic-thermosetting resin for hindering delamination and possibly self-healing in laminate CFRPs* (2022).

19/12/2023 Parma, Italy

XXIII Emilia Romagna Chemistry Day

Participation to the XXIII Chemistry Day of Emilia Romagna region, with a poster entitled "Electrospun rubbery nanofibers: effect of crosslinking on their morphology and properties" focused on the nanofibrous reinforcement of CFRPs laminates.

30/05/2024 Bologna

Navile Day

Participation to the presentation of UniBo scientific departments with a poster entitled "Electrospun rubbery nanofibers: effect of crosslinking on their morphology and properties" focused on the nanofibrous reinforcement of CFRPs laminates.

COMMUNICATION AND INTERPERSONAL SKILLS**Good Communication skills, both in Italian and in English, acquired throughout the PhD, internship and the Master Degree in English Language.****Good ability to work in a team acquired both during the PhD, the internship and working as a Football Coach****MANAGEMENT AND LEADERSHIP SKILLS****Good level of Management, decisional and leadership skills acquired through the management of research projects in the PhD experience, and through the job as a Football coach**

● PROFESSIONAL SKILLS

Good knowledge and ability to use many instruments and techniques acquired throughout the PhD working experience, Master Degree Internship.

- Polymeric Composite Materials (mainly CFRPs): ability to manufacture CFRPs laminates and panels and competences and knowledge on how to reinforce them in order to increase performance, safety and durability.
- Electrospinning - Preparation of polymer blends compatible with the electrospinning process. Ability to design a stable spinning process, obtained by varying the parameters of the solution and the process, in order to obtain the desired nanofibrous morphology in terms of diameter and fibre characteristics. Autonomous use of instrumentation for electrospinning both in single needle with static collecting plate and in multi-needle machine equipped with collecting drum and translating needle block.
- SEM - Autonomous use of bench-top SEM for the morphological characterisation of polymeric and non-polymeric materials, particularly nanostructured materials, after sample preparation and metallisation. Also performing SEM-EDX analysis for qualitative and semi-quantitative elemental analysis.
- ATR-IR spectroscopy on solid samples, including nanostructured ones, and liquids also following their further concentration through Rotavapor and characterisation of the spectra obtained.
- TGA - Acquisition of TGA thermograms, characterisation and their interpretation in order to assess the thermal and/or thermo-oxidative stability of polymeric materials and nano-materials, also possibly modified with inorganic reinforcements/ fillers, quantitative determination of any inorganic fractions present.
- DSC - Acquisition of DSC thermograms to assess the thermal behaviour of both conventional materials and nanofibrous fabrics after sample preparation. Thermogram analysis: determination of glass transition temperature (T_g), melting, crystallisation, cross-linking, degree of crystallinity.
- DMA - DMA analysis to assess T_g and damping capacity of CFRP laminates, possibly nanomodified, as a function of temperature and/or oscillation frequency. Ability to choose the most suitable geometry (in particular three-point bending, dual cantilever and tensile) and instrumental parameters according to the type of material to be analysed.
- Universal testing machine- Carrying out tensile stress-strain tests to assess the mechanical behaviour of polymeric materials also in the form of nanofibrous fabrics, data analysis (determination of elastic modulus, maximum stress, strain at break, toughness).
- Use of office package and specific software for data analysis of TGA and DSC thermograms (Universal Analysis software, TA Instruments), and DMA (Proteus Analysis software, Netzsch).
- Use of Digimizer, specific software for evaluating the dimensions of materials characterised by micro and nanometric dimensions, and ChemDraw, software for drawing molecular structures and simulating mass spectra and NMR.

● ACADEMIC ACTIVITIES

2023 - CURRENT

Co mentor activity

- Masters' Thesis "Membrane elettrofilate per fuel cells: ottimizzazione di soluzioni e parametri di processo" ("Electrospun membranes for fuel cells: optimisation of solutions and process parameters") defended by Dr Davide Damiani, 2024.

● HONOURS AND AWARDS

12/09/2021

Study award for LM in Low Carbon students on Toso Montanari funds - Alma Mater Studiorum - University of Bologna - Department of Industrial Chemistry

It is a reward for the best students of Low Carbon Technologies and Sustainable Chemistry, based on the weighted average of the grades of the exams, the number of ECTS and the bachelor's final grade.

09/2018

AVIS scholarship for high school graduation - AVIS - Associazione Volontari Italiani del Sangue

It is a scholarship for the best graduates in high school among those who have parents who are blood donors.

2018

Rotary Award - Rotary Club Imola

It is a merit award for the best results in both school and sports sectors, obtained for four years, from 2014 to 2018.

05/2016

Bronze Medal in EUSO Science Olympiad - European Final - Chemistry Section – EUSO - European Union Science Olympiads

Chemistry member in a team of three, representing Italy in the European Final in Tallin, Estonia.

02/2016

Winner of EUSO Science Olympiads - Italian competition - Chemistry Section – EUSO - European Union Science Olympiads

Chemistry member in a team of three. 1st place obtained in the Italian division of Science Olympiads.

● **DIGITAL SKILLS**

Microsoft Office (Word, Excel, Power Point) | Social Media / Social Network | Scopus (Elsevier) | OneDrive | Reaxys | Microsoft Teams | Zoom | Google Drive | TA Universal Analysis

● **DRIVING LICENCE**

Driving Licence: B1

● **OTHER WORKING EXPERIENCE**

09/2019 – CURRENT

Coach of U12-U8 Football team

I have been working as a coach of different categories among Under 12 and Under 8 football teams in Imola, Italy

● **VOLUNTEERING**

2017 – CURRENT Imola

Blood Donor at AVIS - Associazione Volontari Italiani del Sangue

All the mentioned documents can be consulted if requested.



Emanuele Manzi