europass

Jean Pierre Miranda Murillo

Date of birth: | **Nationality:** | **Gender:** Male | **Phone number:** | **Email address:** _____ | **Website:**

https://www.linkedin.com/in/jean-pierre-miranda-murillo-1aa5a6145/https://www.linkedin.com/in/jean-pierre-miranda-murillo-1aa5a6145/

Address:

WORK EXPERIENCE

01/01/2022 – CURRENT Genova, Italy

PHD STUDENT UNIVERSITY OF GENOVA

Thesis Complex magnetic fluid for advanced energy applications.
Tutors Prof. Davide Peddis, Diego Colombara.
The activity My research group fabricates *magnetic nanoparticles* for their fundamental study or technological use. My activity was focused on the *chemical synthesis of magnetic* Fe_3O_4, $CoFe_2O_3$ *and CoFe nanoparticles* through *thermal decomposition method* in the framework of the project REusable MAsk Patterning (REMAP, https://re-map.eu/) intended to be used in formulation of a new mask for surface patterning.
Skills I *strengthen* the skills I developed during my period of thesis, especially the soft ones such as *pro-activity, problem solving and independence*. I introduced a new method of synthesis in my professional profile. I participate at different conference with *oral and poster contributions*. I *worked abroad* (Nice, France https://inphyni.univ-cotedazur.fr/) for a period of 6 months studying the effect of a *rotating magnetic field on a system of magnetic particles* dispersed in water. I improved my *language skills* (English, French).
The last year will be dedicated on *simulating a system of interacting magnetic particles in fluids at different viscosity* using the *COMSOL program* under the supervision of UNIGE and the agency GEMMATE.

01/11/2021 – 31/12/2021 Uppsala, Sweden

VISITOR RESEARCHER UNIVERSITY OF UPPSALA

Referees Prof. Roland Mathieu, Dott. Pierfrancesco Maltoni
The activity The activity has been carried on under the framework of developing alternatives for permanent magnets based on rare earths. My brief period was dedicated on obtaining $SrFe_{12}O_{19}$ and FeOOH nanoparticles by hydrothermal method.
Skills Alongside the skills already acquired, I used the Physical Properties Measurement System PPMS (SQUID) device in liquid Helium for the magnetic analysis of the samples.

The scholarship was founded by the Lerici Foundation (https://www.cmlerici.se/).

31/10/2019 – 28/02/2021 Genova, Italy

MASTER THESIS UNIVERSITY OF GENOVA

Thesis Nanostructured metals and metal alloys: synthesis and magnetic characterization.
Tutors Prof. Fabio Michele Canepa, Davide Peddis and Diego Colombara.
The activity The group I worked for had installed a new setup for the *reduction of Cobalt, Iron and Nickel oxides into metal or metallic alloys in controlled atmosphere of hydrogen*. Hence, my activity was developed on the *synthesis and magnetic characterization* of these materials. My samples were analyzed by *X-ray Diffraction, Vibrating Sample Magnetometry, Transmission Electron Microscopy and Atomic Emission Spectroscopy* (Plasma Source).

Skills Alongside the data elaboration, especially XRD and VSM, I worked with the *glove-box, oven in controlled atmosphere and micro- and nano-powder*. The synthesis technique mainly used for the production of the ferrimagnetic and antiferrimagnetic oxides was the *self-combustion sol-gel*.

Business or Sector Professional, scientific and technical activities |

Department Department of Chemistry and Industrial Chemistry | **Address** Via Dodecaneso 31, 16146, Genova, Italy |

Email direzione@chimica.unige.it | **Website** https://chimica.unige.it/

01/09/2018 – 01/12/2018 Genova, Italy

BACHELOR THESIS UNIVERSITY OF GENOVA

Thesis Synthesis and characterization of BOC-aminoaldehydes and their use in Passerini diastereoselective reaction.
Tutor Prof. Luca Banfi.
The activity The research group I was working for had studied the steric effect of different BOC-aminoaldehydes on the final product of the Passerini reaction (i.e., on the diastereoselectivity enhancement).
Skills I performed basic protocols such as *carboxyl group reduction with $NaBH_4$ or TEMPO/BAIB reagents*, but I worked also with *controlled atmosphere and temperature* (Swern reaction). I performed synthesis monitoring (*TLC*), purification (*column cromatography*) and characterization (*HPLC, H-NMR*).

Business or Sector Professional, scientific and technical activities |

Department Department of Chemistry and Chemical Technologies |

Address Via Dodecaneso 31, 16146, Genova, Italy | **Email** direzione@chimica.unige.it |

Website https://chimica.unige.it/

EDUCATION AND TRAINING

31/10/2018 – 29/04/2021 genova , Italy

M. SC. CHEMICAL SCIENCES (SOLID STATE CHEMISTRY APPLIED TO MATERIALS AND ENERGY) Department of Chemistry and Industrial Chemistry

Address Via Dodecaneso 31, 16146, genova , Italy | **Website** https://chimica.unige.it/

30/09/2015 – 19/02/2019 Genova, Italy

B. SC. IN CHEMISTRY AND CHEMICAL TECHNOLOGIES Department of Chemistry and Industrial Chemistry

Address Via Dodecaneso 31, 16146, Genova, Italy | **Website** https://chimica.unige.it/

LANGUAGE SKILLS

Mother tongue(s): **ITALIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	B2	C1	B2	B2	B2
FRENCH	A1	A1	A1	A1	A1

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

DIGITAL SKILLS

Informatic skills

OriginPro 85 | Image-J | Microsoft Office | Microsoft Excel | Microsoft Powerpoint | Mendeley | Microsoft Word

Chemical Laboratory and Synthesis

Solution Combustion Synthesis | Handling with chemicals | Thermal Decomposition | X-Ray Diffraction | Nanomaterials - Synthesis, functionalization, characterization & Applications | Annealing | Hydrogen

ADDITIONAL INFORMATION

DRIVING LICENCE

Driving Licence: B

ISCRIZIONE ALL'ALBO

11/2021 – CURRENT
Abilitato all'iscrizione (Non iscritto) all'albo della federazione nazionale degli ordini dei chimici e dei fisici

HOBBIES AND INTERESTS

Movies, Sports, Travelling, Reading, Writing and Music I am dynamic, but also thoughtful. I am open to discuss topic related to cinema, books and music. I am open to new experiences and to bind through these experiences, especially through sport. I play the cello.

PUBLICATIONS

High-moment FeCo magnetic nanoparticles obtained by topochemical H2 reduction of Co-Ferrites – 2022
Cobalt ferrite nanoparticles of different stoichiometries synthesized by a sol–gel autocombustion method were used as a starting material to obtain high-moment $Fe_{50}Co_{50}$ and $Fe_{66}Co_{34}$ metal nanoparticles by topochemical hydrogen reduction. Structural and magnetic investigations confirmed the formation of FeCo nanoparticles with crystallite sizes of about 30 nm and magnetization at 0.5 T of ~265 Am^2/kg (0 K), which was larger than the expected bulk value, likely because of the incorporation in the body-centered cubic (bcc) FeCo structure of the residual C atoms present on the surface of the oxide particles. Temperature-dependent magnetization measurements in the H_2 atmosphere were also performed to investigate in detail the reduction mechanism and the effect of an external magnetic field on the process efficiency.

A. Omelyanchik, [...] Jean-Pierre Miranda Murillo et al., 2022, MDPI, 12, 1-10

Spinel iron oxide by the co-precipitation method: effect of the reaction atmosphere – 2021
Synthesis atmosphere (i.e., air and nitrogen) effects on the physical properties and formation mechanism of spinel iron oxide nanoparticles prepared via the co-precipitation method have been investigated using a multi-technique approach. The obtained magnetic nanoparticles (MNPs) were characterized using the X-ray diffraction, transmission electron microscopy (TEM), SQUID magnetometry, Mössbauer spectroscopy and X-ray absorption near-edge Structure spectroscopy techniques. The synthesis procedure leads to the formation of a spinel structure with an average crystallite size of 9.0(9) nm. The morphology of the particles synthetized under an inert atmosphere was quasi-spherical, while the nanoparticles prepared in air present a faceted shape. The small differences observed in morphological properties are explained by the influence of the reaction atmosphere on the formation mechanism of the MNPs. The magnetic characterization indicates that both samples exhibit superparamagnetic behavior at 300 K. The investigation by means of the Langevin approach at 300 K also leads to equal values for the mean size of the magnetic cores (D_m). Additionally, the analysis of the Mössbauer spectra revealed the lack of spin disorder for both samples, resulting in a high saturation magnetization. The fit of XANES spectrum suggests that about 2/3 of the iron ions reside in a local environment close to that of γ-Fe_2O_3 and about 1/3 close to that of Fe_3O_4 for the sample synthetized in inert atmosphere.

S. Slimani, [...] Jean-Pierre Miranda Murillo et al. 2021, MDPI, 11, 1-12