



Dr. Noemí Aguiló Aguayo

Research Institute of Textile Chemistry and Textile Physics

Faculty of Chemistry and Pharmacy

University of Innsbruck

Hoechsterstrasse 73, 6850 Dornbirn (Austria)

noemi.aguilo-aguayo@uibk.ac.at

orcid.org/0000-0003-0020-0769

Personal Data

First Name: Noemí

Last Name: Aguiló Aguayo

Birth date: November 6, 1984

Birth Place: Barcelona

Citizenship: Spanish

MAIN AREAS OF INTEREST

- Electrochemical energy storage systems: lithium ion batteries, redox flow batteries.
- Design of sensors and electrodes, energy harvesting fabrics and interactive textiles.
- Particle synthesis, material characterization and coating processes via plating, plasma, sputtering.

MOST IMPORTANT RESEARCH RESULTS

- Implementation and characterization for the first time of high-performance embroidered electrodes in Li-ion batteries and redox flow batteries.
- Optimization of size-controlled carbon-coated iron nanoparticles via arc-plasma for biomedical applications.

EDUCATION

PhD Nanoscience at the University Barcelona

2008-12

Production and characterization of carbon-encapsulated iron nanoparticles by arc-discharge plasma
Dissertation awarded with Excellent Cum Laude and International Mention by the University of Barcelona.

Masters degree in Engineering Physics at the University of Barcelona

2006-07

Synthesis and characterisation of Fe@C nanostructures, awarded with “Jordi Porta i Jué award 2008” by the Physics Catalan Society.

Bachelors degree in Physics at the University of Barcelona

2002-06

RESEARCH EXPERIENCE

University of Innsbruck, Austria

Hertha-Firnberg FWF research fellow

October 2018-Present

Postdoctoral fellow, Advisor: Prof. Dr. Thomas Bechtold

January 2013-October 2018

Research topics: high-energy flexible Li-ion batteries, redox flow batteries, carbon-based and metallic electrodes, and electronic textiles.

École Polytechnique Fédérale de Lausanne, Switzerland

March 2011-June 2011

Predocctoral fellow, Advisor: Prof. Dr. Heinrich Hofmann

Research topics: Surface functionalization and characterization of iron nanoparticles for biomedical applications.

University of Pittsburgh, United States

October 2009-December 2009

Predocctoral fellow, Advisor: Prof. Dr. Judith C. Yang

Research topics: In-situ thermal treatments of carbon-based iron nanoparticles and material characterization.

University of Barcelona, Spain

January 2008-December 2012

Graduate researcher, Advisor: Prof. Dr. Enric Bertran

Research topics: Synthesis and characterization of carbon-coated iron nanoparticles and carbon nanotubes using arc-discharge plasma and chemical vapour deposition.

PEER-REVIEWED PUBLICATIONS (from 2016 - Present)

1. **Aguiló-Aguayo, N.**; Drozdik, T.; Bechtold, T. The role of electrode orientation to enhance mass transport in redox flow batteries, *Electrochemistry Communications* **2020**, 111, 106650, 1-5. DOI: 10.1016/j.elecom.2019.106650
2. Schindler, S.; **Aguiló-Aguayo, N.**; Dornbierer, U.; Bechtold, T. Anodic coating of 1.4622 stainless steel with polydopamine by repetitive cyclic voltammetry and galvanostatic deposition, *Industrial & Engineering Chemistry Research* **2019**, In Press. DOI: 10.1021/acs.iecr.9b05603
3. **Aguiló-Aguayo, N.**; Bechtold, T. Monitoring the state-of-charge in all-iron aqueous redox flow batteries, *Journal of the Electrochemical Society* **2018**, 165, 13, A3164-A3168. DOI: 10.1149/2.0911813jes
4. Lenninger, M.; **Aguiló-Aguayo, N.**; Bechtold, T. Quantification of triethanolamine through measurement of catalytic current in alkaline iron-D-gluconate solution, *Journal of Electroanalytical Chemistry* **2018**, 830-831, 50-55. DOI: 10.1016/j.jelechem.2018.10.026
5. Root, W.; **Aguiló-Aguayo, N.**; Pham, T.; Bechtold, T. Conductive layers through electroless deposition of copper on woven cellulose lyocell fabrics. *Surface and Coatings Technology* **2018**, 348, 13-21. DOI: 10.1016/j.surfcoat.2018.05.033
6. **Aguiló-Aguayo, N.**; Amade, R.; Hussain, S.; Bertran, E.; Bechtold T. New three-dimensional porous electrode concept: vertically-aligned carbon nanotubes directly grown on embroidered copper structures. *Nanomaterials* **2017**, 7(12), 438, 1-10 DOI: 10.3390/nano7120438
7. Breitung, B.; **Aguiló-Aguayo, N.**; Bechtold, T.; Hahn, H.; Janek, J.; Brezesinski, T. Embroidered copper microwire current collector for improved cycling performance of silicon anodes in lithium-ion batteries, *Scientific Reports* **2017**, 7(13010), 1-6 DOI: 10.1038/s41598-017-13261-y

8. Sanaee, M. R.; Chaitoglou, S.; **Aguiló-Aguayo, N.**; Bertran, E. Size control of carbon encapsulated iron nanoparticles by arc discharge plasma method. *Applied Sciences* **2017**, 7(26), 1-15 DOI: 10.3390/app7010026
9. **Aguiló-Aguayo, N.**; Pena Espiñeira, P.; Manian A.P.; Bechtold T., Three-dimensional Embroidered Current Collectors for Ultra-Thick Electrodes in Batteries, *RSC Advances* **2016**, 6, 69685- 69690 DOI: 10.1039/c6ra07413h
10. **Aguiló-Aguayo, N.**; Amann, P.; Pena Espiñeira, P.; Petrasch, J.; Bechtold, T. X-ray micro tomography of three-dimensional embroidered current collectors for lithium-ion batteries. *J. Power Sources* **2016**, 306, 826–831 DOI: 10.1016/j.jpowsour.2015.10.039

ADDITIONAL MOST IMPORTANT RESEARCH ACHIEVEMENTS (last 5 years)

Awards & Recognitions:

1. 2017: “**Förderungspreis des Landes Tirol für Wissenschaft**” - Promotion award of Science of the State of Tyrol (Innsbruck, Austria).

Principal Investigator of funded Projects:

2. Embroidered electrodes for the fundamental understanding of redox flow cells (EmbelRed) funded by the FWF Hertha Firnberg Programme (2018-2021). Funding amount: **234 k€**.
3. Embroidered electrodes for high-performance Li-ion batteries funded by the Office of the Vice-Rector for Research of the University of Innsbruck under the program “Nachwuchsfördermittel aus der Nachwuchsförderung der LFU – 2017”, (2017-2018). Funding amount: **22 k€**.

Patents (last 5 years):

4. Redox flow battery. Patent No. 19169602.0-1108.
Inventors: Schröder, P.; Obendorf, D.; Bonn, G.; **Aguiló-Aguayo, N.**; Rhomberg, D.; Drozdzik, T.; Bechtold, T., 16.04.2019.
5. Textile-based temperature sensing device and uses thereof. Patent No. 19166004.2-1001.
Inventors: Bechtold, T.; Root, W.; Pham, T.; **Aguiló-Aguayo, N.**, 28.03.2019.

Participation in international conferences (last 5 conferences):

6. 18. Österreichische Chemietage, Oral presentation. Linz (Austria), September 2019.
7. The International Flow Battery Forum. Poster presentation. Lyon (France), June 2019.
8. 69th Annual Meeting of the International Society of Electrochemistry. Poster presentation. Bologna (Italy), September 2018.
9. 6. GÖCH Symposium Physikalische Chemie und Elektrochemie in Österreich. Invited presentation, Graz (Austria), May 2018.
10. 17. Österreichische Chemitage 2017. Poster presentation, Salzburg (Austria), September 2017.