



Dr. Noemí Aguiló-Aguayo

Research Institute of Textile Chemistry and Textile Physics

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Personal Data

First Name: Noemí

Last Name: Aguiló Aguayo

Birth date: 1984

Birth place: Barcelona

Citizenship: Spanish

Main Areas of Interest

Applied electrochemistry, electrochemical energy storage systems, Li-ion batteries, redox flow batteries, three-dimensional porous electrodes, conductive textiles, electronic textiles, carbon fibers, carbon nanostructures, material characterization, coatings, particle synthesis.

Education

2008-2012

PhD in Nanoscience at the University of Barcelona

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.

2006-2007

Master degree in Engineering Physics at the University of Barcelona

Synthesis and characterization of Fe@C nanostructures

Master's thesis awarded with "Jordi Porta i Jué award 2008" by the Catalan Physics Society.

2002-2006

Bachelors degree in Physics at the University of Barcelona

Research Experience

Jun 2021-
Present

Senior Scientist, Research Institute of Textile Chemistry/Physics,
University of Innsbruck, Austria.

Apr 2022-May
2022

Research stay at the Energy Technology Research Group with Prof. Dr.
Carlos Ponce de León, Department of Mechanical Engineering, Faculty of
Engineering and Physical Sciences, University of Southampton, UK.

Oct 2018-Sep 2022	Hertha-Firnberg FWF postdoctoral fellow, Research Institute of Textile Chemistry/Physics, University of Innsbruck, Austria.
Jan 2013-Oct 2018	Postdoctoral fellow. Advisor: Prof. Dr. Thomas Bechtold, Research Institute of Textile Chemistry/Physics, University of Innsbruck, Austria.
Mar 2011-Jun 2011	PhD visitor student. Advisor: Prof. Dr. Heinrich Hofmann, Powder Technology Laboratory, École Polytechnique Fédérale de Lausanne, Switzerland.
Oct 2009-Dec 2009	PhD visitor student. Advisor: Prof. Dr. Judith C. Yang, Swanson School of Engineering, University of Pittsburgh, USA.
Jan 2008-Dec 2012	PhD student. Advisor: Dr. Enric Bertran, Applied Physics Department, Faculty of Physics, University of Barcelona, Catalonia, Spain.

LIST OF FUNDED PROJECTS

As Principal Investigator:

- Microsized Conductive lines and structural Coloration on Textiles (CONCOTEX) funded by the COIN Programme FFG 881256 (Jan 2021- Dec 2022): Funding amount: 457 k€.
- Embroidered electrodes for high-performance redox flow batteries (EMBROIDER-POWER) E01-08 funded by the European project ELLIT (European Light Industries Innovation and Technology) financed by the COSME program (Sep 2020 – Feb 2022). Funding amount: 70 k€.
- Embroidered electrodes for the fundamental understanding of redox flow cells (EmbelRed) funded by the FWF Hertha Firnberg Programme T-1041 (Oct 2018-Sep 2022). Funding amount: 234 k€.
- 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”, (Sep 2017- Aug 2018). Funding amount: 22 k€.

PEER-REVIEWED PUBLICATIONS (from 2018-Present)

1. **Aguiló-Aguayo, N.**; Drozdik, T.; Bechtold, T. Impedance analysis of electrodes made of continuous carbon filaments in a 20 cm² redox flow cell, *Journal of Electroanalytical Chemistry*, **2022**, 926 (116954), 1-10. DOI: 10.1016/j.jelechem.2022.116954.
2. Schröder, P.; **Aguiló-Aguayo, N.**; Obendorf, D.; Bechtold, T. Near to neutral pH all-iron redox flow battery based on environmentally compatible coordination compounds, *Electrochimica Acta*, **2022**, 430 (141042), 1-9. DOI: 10.1016/j.electacta.2022.141042

3. Landsiedel, J.; Root, W.; **Aguiló-Aguayo, N.**; Duelli, H.; Bechtold, T.; Pham, T. Multi-point flexible temperature sensor array and thermoelectric generator made from copper-coated textiles, *Sensors*, **2021**, 21(11), 3742. DOI:10.3390/s21113742
4. Abdelileh, M.; Manian, A. P.; Rhomberg, D.; Ticha M.B.; Meksi, N.; **Aguiló-Aguayo, N.**; Bechtold, T. Calcium-iron-D-gluconate complexes for the indirect cathodic reduction of indigo in denim dyeing: A greener alternative to non-regenerable chemicals, *Journal of Cleaner Production*, **2020**, 266 (121753), 1-11. DOI: 10.1016/j.jclepro.2020.121753
5. Schröder, P.; **Aguiló-Aguayo, N.**; Auer, A.; Griesser C.; Kunze-Liebhäuser, J.; Ma, Y.; Hummer, M.; Obendord, D.; Bechtold, T. Activation of carbon tow electrodes for use in iron aqueous redox systems for electrochemical applications, *Journal of Materials Chemistry C*, **2020**, 8, 7755-7764. DOI: 10.1039/D0TC00594K
6. **Aguiló-Aguayo, N.**; Hubmann, D.; Ullah Khan, F.; Arzbacher, S.; Bechtold, T. Water-based slurries for high-energy LiFePO₄ batteries using embroidered current collectors, *Scientific Reports*, (**2020**) 10, 5565. DOI: 10.1038/s41598-020-62553-3
7. **Aguiló-Aguayo, N.**; Drozdziak, 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
8. 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
9. **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
IF (SCI): 3.12, Q1, Electrochemistry / Electronic, Optical and Magnetic Materials.
10. 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
IF (SCI): 3.218, Q1, Chemical Engineering.
11. 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
IF (SCI): 3.192, Q1, Materials Chemistry.

PATENTS (from 2018-Present)

1. Redox flow battery. Patent No. 19169602.0-1108.
Inventors: Schröder, P.; Obendorf, D.; Bonn, G.; **Aguiló-Aguayo, N.**; Rhomberg, D.; Drozdziak, T.; Bechtold, T., 16.04.2019.
2. 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.

CONFERENCES (from 2018-Present)

Up until today, I have participated in 28 conferences with 6 invited presentations, 11 oral presentations and 11 posters, one of which has received an award for the best poster.

1. Landsiedel, J.; Stroj, S.; Domke, M.; Kasemann, S.; Bechtold, T.; Pham, T.; **Aguiló-Aguayo, N.**: Bottom-up process to create localized copper conductive lines on fabrics. Poster presentation. European Materials Research Society (E-MRS) Spring Meeting, Straßburg, 2022-05-30.
2. **Aguiló-Aguayo, N.** and T. Bechtold. Iron(III/II)-triethanolamine redox system in redox flow batteries. Oral presentation. 18. Österreichische Chemietage, Meeting of the German & Austrian Chemical Societies. Oral presentation. Linz (Austria), September 2019.
3. **Aguiló-Aguayo, N.**; Drozdziak, T.; Bechtold, T. Evaluation of the mass transport phenomena in embroidered electrodes with controlled geometries and arrangements. Poster presentation. The International Flow Battery Forum. Lyon (France), June 2019.
4. **Aguiló-Aguayo, N.**; Hubman, D.; Khan, F. U.; Arzbacher, S.; Bechtold, T. Embroidered electrodes to solve existing problems in electrochemical energy storage systems. Poster presentation. 69th Annual Meeting of the International Society of Electrochemistry. Bologna (Italy), September 2018.
5. **Aguiló-Aguayo, N.**, Bechtold, T. Embroidered structures in electrochemical energy storage devices. Invited presentation 6. GÖCH Symposium Physikalische Chemie und Elektrochemie in Österreich, Graz (Austria), May 2018.