Charles DELACOURT

CNRS Researcher at Laboratoire de Réactivité et Chimie des Solides
M. Sc. Analytical Chemistry – Ph. D. Materials Chemistry
Specialist in Li-ion batteries

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Work and Research Experience

Since Nov 2007 — **CNRS Researcher at Laboratoire de Réactivité et Chimie des Solides, UMR CNRS 7314, University of Picardie, Amiens, FRANCE**
Mathematical modeling of lithium-ion batteries. Performance and aging analysis.

Jan 2012 – Dec 2012 — **Research affiliate at Lawrence Berkeley National Lab. in Venkat Srinivasan's research group, Environmental Energy Technologies Division, Berkeley, CA, USA**
Model experiments and mathematical modeling to understand degradation phenomena in lithium-ion batteries.

Feb 2006 – Oct 2007 — **Postdoc in Prof. Newman group at Lawrence Berkeley National Lab. Berkeley, CA, USA**
Electrochemical reduction of carbon dioxide to make liquid fuels : Design of an electrochemical cell based on the technology used for proton-exchanged membrane fuel cells (PEMFC) and optimization of the cell by using mathematical modeling.

Education

Jan 2016 — **Research Habilitation in Sciences – University of Picardie, Amiens, FRANCE**

Nov 2005 — **Ph.D. Materials Chemistry, with honors – University of Picardie, Amiens, FRANCE**

2002 — **M.Sc. Analytical Chemistry, ranked 1st, with honors – University Pierre & Marie Curie, Paris, FRANCE**

2001 — **B.Sc. Physics and Chemistry, ranked 1st, with honors – University of Picardie, Amiens, FRANCE**

Competitive Examinations

2007 — **CNRS Research Associate (2nd class), section "Material chemistry, nanomaterials and processes", ranked 1st in national contest**

2000 — **CAPES in Physics and Chemistry (Examination for high-school teacher position), ranked 1st in national contest**

2000 — **CAPLP2 in Mathematics, Physics and Chemistry (Examination for technical high-school teacher position)**

Awards

2012 — **Selected along with 4 other finalists for the "BASF/VW Award in Electrochemistry"**
(`https://www.science-award.com/en/sae/`)

2011 — **"Carl Wagner Medal of Excellence in Electrochemical Engineering 2011" (1,500 €)**
(`http://www.efce.org/Working+Parties/Electrochemical+Engineering.html`)

2009 — **"Oronzio and Niccolò De Nora Foundation Prize of ISE on Applied Electrochemistry" ($ 1,500)**
(`http://www.ise-online.org/`)

2007 — **"2007 Umicore Scientific Award" (10,000 €)**
(`http://www.umicore.com/en/features/innovationAward/innovationAward.htm`)

2005 — **"Battery Division Student Award of the Electrochemical Society (USA)" ($ 1,000)**
(`http://www.electrochem.org/awards/student/student_awards.htm`)

SKILLS

Chemical Engineering	• Mathematical modeling of electrochemical systems (Numerical methods such as FDM, FVM, FEM, programming in Fortran, Comsol, Matlab, Maple...) • Transport Phenomena in dilute and concentrated solutions • Chemical and electrochemical kinetics • Interfacial phenomena
Electrochemistry	• Electroanalytical techniques (voltammetry, impedance spectroscopy) • Solid-state electrochemical techniques (charge/discharge cycling, GITT, PITT, impedance, etc.) applied to materials for Li-ion batteries • Performance and aging tests on commercial Li-ion cells (on large-current cyclers) • Electrodeposition techniques • Preparative electrolysis using the PEMFC technology • Electrocatalysis
Material Science	• Materials synthesis by solid state chemistry and solution routes (Hydrothermal, precipitation • Powder X-Ray and Neutron diffraction, and analysis by Rietveld method • Thermal analyses (Thermogravimetry, Differential thermal analysis and differential scanning calorimetry) • Specific surfaces measurements using BET • Scanning electron microscopy (SEM) coupled with elemental analysis through energy dispersive spectroscopy (EDX) • X-Ray absorption spectroscopies (XANES et EXAFS) • Mössbauer spectroscopy of ^{57}Fe • Electrical conductivity measurements (AC and DC methods)
Analytical Chemistry	• Aqueous and non-aqueous Chemistry (species distribution diagrams as a function of pH, potential...) • Ion-exchange separations • Chromatographies, atomic spectroscopies (emission and absorption), mass spectrometry, ion-beam analyses (RBS, NRA, ERDA, PIXE)
Langages	English (fluent), German (scholar, 5 years)
Computer	Microsoft Office, LaTeX, Internet tools.

MENTORING/SUPERVISION

POSTDOCS

Jan 14 - Jul 16	**Dr. M. T. Dinh Nguyen (LRCS, University of Picardie)** "Understanding interfaces in Li-ion batteries through in situ and analytical methods" • Funding : SIRBATT project (FP7) • Cosupervision with Prof. S. Laruelle (LRCS) • Now engineer at Renault
Nov 10 - Oct 12	**Dr. M. Kassem (LRCS, University of Picardie)** "The SIMCAL project : Calendar life study and modeling of NiMH and Li-ion batteries for road Vehicles" • Funding : SIMCAL project (ANR) • Cosupervision with Dr. M. Morcrette (LRCS) • Now assitant professor at Université du Littoral Côte d'Opale (Dunkerque, France)
Oct 08 - May 11	**Dr. W. Liu (LRCS, University of Picardie)** "The SIMSTOCK project : Accelerated aging tests and modeling of batteries for use in hybrid electric vehicles" • Funding : SIMSTOCK project (ADEME) • Cosupervision with Dr. M. Morcrette (LRCS) • Now assitant professor at University of Jilin (China)

PHD STUDENTS

Dec 17 – Dec 21	**T. T. Nguyen (LRCS, University of Picardie ; Renault R&D)** "Modeling of transport properties in positive electrodes for high-energy-density Li-ion batteries" • Funding : Renault and ANRT (CIFRE) • Ph. D. adviser with Dr. A. Demortière and Dr. B. Fleutot

Oct 17 – Oct 22

C. Rabette (LRCS, University of Picardie)
"Determination of electrolyte transport properties for Li-ion batteries"
• Funding : Region Hauts-de-France and FEDER
• Ph. D. adviser with Prof. J. P. Chehab and Dr. B. Fleutot

Nov 15 - Dec 18

G. Assat (LRCS, University of Picardie ; College de France)
"From measurements to modeling of mechanisms governing the electrochemical performance of novel Li-rich lamellar oxides"
• Funding : RS2E network
• Ph. D. adviser at 50% with Prof. J. M. Tarascon (College de France)

Oct 15 - Oct 18

V. Bandla Nehru (LRCS, University of Picardie ; French Institute of Petroleum and Novel Energies)
"Aging nonuniformities in Li-ion cells"
• Funding : IFPEn
• Ph. D. adviser at 50% with Dr. M. Morcrette (LRCS)

Dec 14 - Jul 15

R. Elango (LRCS, University of Picardie)
"Soluble redox couples as an analytical probe or as an additive for the design of Li-ion batteries with improved safety and lifetime"
• Funding : MNERT (Ministry of Research)
• Ph. D. adviser at 100%

Nov 14 - Jan 18

S. Malifarge (LRCS, University of Picardie ; Renault R&D)
"Modeling of high-energy-density Li-ion battery negative electrodes"
• Funding : Renault and ANRT (CIFRE)
• Ph. D. adviser at 70% with Prof. A. Franco (LRCS)

Oct 09 - Jan 13

S. D. Fabre (LRCS, University of Picardie ; STMicroelectonics R&D ; CEA-LITEN)
"Mathematical modeling and characterization of the electrochemical behavior of lithium microbatteries"
• Funding : STMicroelectonics and ANRT (CIFRE)
• Ph. D. adviser at 90% with Prof. L. Dupont (LRCS)
• Now R&D engineer at Aerospatiale Batteries (Bourges, France)

Oct 08 - Nov 11

M. Safari (LRCS, University of Picardie ; Renault R&D)
"Aging of Li-ion batteries : Experiments and mathematical modeling"
• Funding : Renault and ANRT (CIFRE)
• Ph. D. adviser at 95% with Prof. J. M. Tarascon (LRCS)
• Now assistant professor at university of Hasselt (Belgium)

MSc STUDENTS

Feb 19 - Jul 19

C. Descamps (University of Picardie, Master 2 in Mathematics)
"Optimization Methods for the Determination of Electrolyte Transport Properties for Li-ion Batteries"
Cosupervision with Prof. J. P. Chehab and Dr. B. Fleutot

Mar 17 - Sep 17

K. Araño (University of Picardie, Erasmus Mundus Master MESC)
"Determination of Electrolyte Transport Properties for Li-ion Batteries"
Cosupervision with Dr. B. Fleutot

Mar 16 - Sep 16

A. Geng (University of Hamburg, Erasmus Mundus MATHMODS)
"Microstructurally-resolved modeling of transport and electrochemistry in lithium-ion batteries"
Cosupervision with Prof. A. Franco and Dr. A. Demortière

Mar 15 - Jul 15

J. Vergnet (Ecole Polytechnique, Paris-Saclay)
"Modeling mixed redox in a cathode material"
Cosupervision with Prof. J. M. Tarascon (College de France)

Feb 11 - Sep 11

M. Farkhondeh (University of Picardie, Erasmus Mundus MESC)
"Mathematical modeling of commercial $LiFePO_4$ electrodes based on variable solid-state diffusivity"

Feb 08 - Sep 08

M. Safari (University of Picardie, Erasmus Mundus MESC)
"Aging of Li-ion batteries"

OTHER

Jun 18 - Jul 18

T. Candelier, 3rd yr IT student (University of Picardie)
"Development of a GUI for the Li-ion battery simulation software DumBat"

May 12 - Dec 12	**A. Kwong (Lawrence Berkeley National Lab., UC Berkeley undergrad. internship)** "Effect of Manganese Contamination on the Solid-Electrolyte-Interphase Properties in Li-Ion Batteries"
Jul 08	**M. Ati (University of Picardie, Erasmus Mundus MESC, Master 1)** "Calendar aging of commercial Li-ion batteries : development of a computer program for data analysis"
Jan 07 - May 07	**T. Pica (UC Berkeley undergrad. internship)** "Study of CO_2 reduction on silver in an aqueous electrolyte"
Jan 07 - May 07	**S. Bhatnagar (UC Berkeley undergrad. internship)** "Photons to Fuels LDRD project"
Feb 06 - Dec 06	**G. Mariansky (UC Berkeley undergrad. internship)** "The Electrochemical Reduction of Carbon Dioxide to Methanol"
Feb 06 - Dec 06	**N. Taksatorn (UC Berkeley undergrad. internship)** "Photons to Fuels LDRD project"

TEACHING EXPERIENCE

Since 2022	**Teaching in the CNRS formations entreprises – CNRS, France** "Li-ion Battery aging" (1-day session)
Since 2022	**Teaching in the EPA research master" – IFP school, Rueil-Malmaison, France** "Approfondissements en électrochimie des batteries" (1 to 2.5-day session, several times over the yr)
Since 2019	**Teaching in the GMPHE Mastère and "formations inter-entreprises" – IFP training, Rueil-Malmaison, France** "Fondamentaux Batteries" (1 to 2.5-day session, several times over the yr)
Since 2013	**Teaching in the Master "Electrochemistry and processes" – PHELMA, Grenoble INP, France** "Electrochemistry for Energy storage and conversion, Modeling of electrochemical systems, application to Li-ion batteries" (4 hrs/y)
2009 – 2019	**Teaching in MESC (Master for Energy Storage and Conversion) – University of Picardie, Amiens, France** "Introduction to Electrochemical Engineering" (10–12 hrs/y)
2013	**Teaching in the Master "Energy systems and markets" – ENSE^3, Grenoble INP, France** "Aging of Li-ion batteries : Experiments and modeling" (4 hrs/y)
2002 – 2005	**Teaching Assistant (65 hrs/y) – University of Picardie, Amiens, France** • 2004 – 2005 : Crystallography for Sophomores (22 hrs/y), Phase diagrams and application to synthesis for sophomores (22 hrs/y), Analytical techniques for master students (10 hrs/y), Introduction to chemical and structural analysis to Freshmen (10 hrs/y) • 2002 – 2004 : Thermodynamics for Freshmen (55 hrs/y), Fuel-cell technologies for master students (10 hrs/y)
2000	**High-School Teacher in Physics and Chemistry – Lycée J.B. Delambre, Amiens, France**

BOOK CHAPTERS

2. **"Mathematical Modeling of Aging of Li-Ion Batteries"**, C. Delacourt and M. Safari, in *Physical Multiscale Modeling and Numerical Simulation of Electrochemical Devices for Energy Conversion and Storage, Green Energy and Technology* (A. A. Franco et al., eds.), ch. 5, pp. 151-190, Springer-Verlag, London (2016).

1. **"Vieillissement des accumulateurs Li-ion dans l'automobile"**, C. Delacourt, C. Ades, and Q. Badey, *Tech. Ing.*, **RE231**, 1-33 (2014)

PUBLICATIONS

66. **"Determination of Transport Properties of Electrolyte With or Without Convection"**, C. Delacourt and C. Rabette, *J. Electrochem. Soc.*, **Accepted for publication** (March 2023))

65. **"Mathematical Modeling of Energy-dense NMC Electrodes : Part II. Data Analysis with Newman Model and with an Extended Model Accounting for Particle Agglomeration"**, T. T. Nguyen, B. Delobel, A. Demortière, and C. Delacourt, *J. Electrochem. Soc.*, **169(6)**, 060510 (2022)

64. **"Mathematical Modeling of Energy-Dense NMC Electrodes : I. Determination of Input Parameters"**, T. T. Nguyen, B. Delobel, M. Berthe, B. Fleutot, A. Demortière, and C. Delacourt, *J. Electrochem. Soc.*, **169(4)**, 040546 (2022)

63. **"3D Operando Monitoring of Lithiation Spatial Composition in NMC Cathode Electrode by X-ray Nano-CT & XANES Techniques"**, T. T. Nguyen, J. Xu, Z. Su, V. De Andrade, B. Delobel, C. Delacourt, and A. Demortière, *Microsc. Microanal.*, **28 (Suppl. 1)**, 194 (2022)

62. **"New Insights on Tortuosity Determination by EIS for Battery Electrodes : Effect of Electrolyte Concentration and Temperature"**, F. Alcaide, C. Delacourt, I. Urdampilleta, R. Vicedo, and E. Ayerbe, *J. Electrochem. Soc.*, **168(11)**, 110514 (2021)

61. **"Determination of Electrolyte Transport Properties with a Multi-Reference-Electrode Cell"**, C. Rabette, I. Tekaya, M. Farkhondeh, B. Fleutot, and C. Delacourt, *J. Electrochem. Soc.*, **168**, 060509 (2021)

60. **"3D Quantification of Microstructural Properties of $LiNi_{0.5}Mn_{0.3}Co_{0.2}O_2$ High-Energy Density Electrodes by X-Ray Holographic Nano-Tomography"**, T. T. Nguyen, J. Villanova, Z. Su, R. Tucoulou, B. Fleutot, B. Delobel, C. Delacourt, and A. Demortière, *Adv. En. Mater.*, **11(8)**, 2003529 (2021)

59. **"Operando decoding of chemical and thermal events in commercial Na(Li)-ion cells via optical sensors"**, J. Huang, L. A. Blanquer, J. Bonefacino ; E.R. Logan, D. A. Dalla Corte, C. Delacourt, B.M. Gallant, S. T. Boles, J.R. Dahn, H.Y. Tam, J.M. Tarascon, *Nature Energy*, **5(9)**, 674-683 (2020)

58. **"The electrode tortuosity factor : why the conventional tortuosity factor is not well suited for quantifying transport in porous Li-ion battery electrodes and what to use instead"**, T. T. Nguyen, A. Demortiere, B. Fleutot, B. Delobel, C. Delacourt, S. J. Cooper, *NPJ Comp. Mater.*, **6(1)**, 123 (2020)

57. **"Exploring the Kinetic Limitations Causing Unusual Low-Voltage Li Reinsertion in Either Layered or Tridimensional Li_2IrO_3 Cathode Materials"**, B. Li, G. Assat, P. E. Pearce, V. A. Nikitina, A. Iadecola, C. Delacourt, J. M. Tarascon, *Chem. Mater.*, **32(5)**, 2133-2147 (2020)

56. **"Probing the thermal effects of voltage hysteresis in anionic redox-based lithium-rich cathodes using isothermal calorimetry"**, G. Assat, S. L. Glazier, C. Delacourt, J. M. Tarascon, *Nature Energy*, **4**, 647-656 (2019)

55. **"Experimental and modeling analysis of graphite electrodes with various thicknesses and porosities for high-energy-density Li-ion batteries"**, S. Malifarge, B. Delobel, and C. Delacourt, *J. Electrochem. Soc.*, **165(7)**, A1275-A1287 (2018)

54. **"Breathing and oscillating growth of solid-electrolyte-interphase upon electrochemical cycling"**, Zengqing Zhuo, Peng Lu, Charles Delacourt, Ruimin Qiao, Kang Xu, Feng Pan, Stephen J. Harris, and Wanli Yang, *Chem. Commun.*, **54**, 814 (2018)

53. **"Guidelines for the Analysis of Data from the Potentiostatic Intermittent Titration Technique on battery electrodes"**, S. Malifarge, B. Delobel, and C. Delacourt, *J. Electrochem. Soc.*, **164(14)**, A3925-A3932 (2017)

52. **"Fundamental interplays between bulk anionic and cationic redox that govern kinetics and thermodynamics of Li-rich cathodes"**, G. Assat, D. Foix, C. Delacourt, A. Iadecola, R. Dedryvère, and J. M. Tarascon, *Nature Comm.*, DOI : 10.1038/s41467-017-02291-9 (2017)

51. **"Decoupling Cationic-Anionic Redox Processes in a Model Li-rich Cathode via Operando X-ray Absorption Spectroscopy"**, G. Assat, A. Iadecola, R. Dedryvère, C. Delacourt, and J. M. Tarascon, *Chem. Mater.*, **29**, 9714-9724 (2017)

50. **"Determination of Tortuosity Using Impedance Spectra Analysis of Symmetric Cell"**, S. Malifarge, B. Delobel, and C. Delacourt, *J. Electrochem. Soc.*, **164(11)**, E3329-E3334 (2017)

49. **"Method of the Four-Electrode Electrochemical Cell for the Characterization of Concentrated Binary Electrolytes : Theory and Application"**, M. Farkhondeh, M. Pritzker, C. Delacourt, S. S.-W. Liu, and M. Fowler, *J. Phys. Chem. C*, **121**, 4112-4129 (2017)

48. **"Mesoscopic Modeling of a $LiFePO_4$ Electrode : Experimental Validation under Continuous and Intermittent Operating Conditions"**, M. Farkhondeh, M. Pritzker, M. Fowler, and C. Delacourt, *J. Electrochem. Soc.*, **164(11)** E3040-E3053 (2017)

47. **"Quantification of preferred orientation in graphite electrodes for Li-ion batteries with a novel X-ray-diffraction-based method"**, S. Malifarge, B. Delobel, and C. Delacourt, *J. Power Sources*, **343**, 338-344 (2017)

46. **"Practical assessment of anionic redox in high energy density layered oxide cathodes : A mixed blessing"**, G. Assat, C. Delacourt, D. Alves Dalla Corte, and J. M. Tarascon, *J. Electrochem. Soc.*, **163(14)**, A2965-A2976 (2016)

45. **"Transport Property Measurement of Binary Electrolytes Using a 4-Electrode Electrochemical Cell"**, M. Farkhondeh, M. Pritzker, M. Fowler, M. Safari, and C. Delacourt, *Electrochem. Comm.*, **67**, 11-15 (2016)

44. **"Electrochemical Characterization of the Solid Electrolyte Interphase Using Ferrocene/Ferrocenium as a Redox Shuttle"**, M. T. Dinh Nguyen and C. Delacourt, *J. Electrochem. Soc.*, **163(5)**, A706-A713 (2016)

43. **"Mesoscopic Modeling of Li Insertion in Phase-Separating Electrode Materials : Application to Lithium Iron Phosphate"**, M. Farkhondeh, M. Pritzker, M. Fowler, M. Safari, and C. Delacourt, *Phys. Chem. Chem. Phys.*, **16**, 22555-22565 (2014)

42. **"Measurements and Simulations of Electrochemical Impedance Spectroscopy of a Three-Electrode Coin Cell Design for Li-Ion Cell Testing"**, C. Delacourt, V. Srinivasan, and V. Battaglia, *J. Electrochem. Soc.*, **161(9)**, A1253-A1260 (2014)

41. **"Full-Range Simulation of a Commercial $LiFePO_4$ Electrode Accounting for Bulk and Surface Effects : A Comparative Analysis"**, M. Farkhondeh, M. Safari, M. Pritzker, M. Fowler, Taeyoun Han, Jasmine Wang, and C. Delacourt, *J. Electrochem. Soc.*, **161(3)**, A201-A212 (2014)

40. **"Continuum transport laws for locally non-neutral concentrated electrolytes"**, C. W. Monroe and C. Delacourt, *Electrochim. Acta*, **114**, 649-657 (2013)

39. **"Modeling Li-ion batteries with electrolyte additives or contaminants"**, C. Delacourt, *J. Electrochem. Soc.*, **160(11)**, A1997-A2004 (2013)

38. **"Effect of Manganese Contamination on the Solid-Electrolyte-Interphase Properties in Li-Ion Batteries"**, C. Delacourt, A. Kwong, X. Liu, R. Qiao, W. L. Yang, P. Lu, S. J. Harris, and V. Srinivasan, *J. Electrochem. Soc.*, **160(8)**, A1099-A1107 (2013)

37. **"Postmortem Analysis of Calendar-Aged Graphite/$LiFePO_4$ Cells"**, M. Kassem and C. Delacourt, *J. Power Sources*, **235**, 159-171 (2013)

36. **"Life Simulation of a Graphite/$LiFePO_4$ Cell under Cycling and Storage"**, C. Delacourt and M. Safari, *J. Electrochem. Soc.*, **159(8)**, A1283-A1291 (2012)

35. **"Calendar Aging of a Graphite/$LiFePO_4$ Cell"**, M. Kassem, J. Bernard, R. Revel, S. Pélissier, F. Duclaud, and C. Delacourt, *J. Power Sources*, **208**, 296-305 (2012)

34. **"Enabling the Li-ion Conductivity of Li-metal Fluorosulphates by Ionic Liquid Grafting"**, P. Barpanda, R. Dedryvère, M. Deschamps, C. Delacourt, M. Reynaud, A. Yamada, and J. M. Tarascon, *J. Solid State Electrochem.*, **16**, 1743-1751 (2012)

33. **"Mathematical Modeling of Commercial $LiFePO_4$ Electrodes Based on Variable Solid-state Diffusivity"**, M. Farkhondeh and C. Delacourt, *J. Electrochem. Soc.*, **159(2)**, A177-A192 (2012)

32. **"Charge/Discharge Simulation of an All-solid-state Thin-film Battery Using a One-dimensional Model"**, D. Fabre, D. Guy-Bouyssou, P. Bouillon, F. Le Cras, and C. Delacourt, *J. Electrochem. Soc.*, **159(2)**, A104-A115 (2012)

31. **"Simulation-based analysis of aging phenomena in a commercial graphite/$LiFePO_4$ cell"**, M. Safari and C. Delacourt, *J. Electrochem. Soc.*, **158(12)**, A1436-A1447 (2011)

30. **"Aging of a Commercial Graphite/$LiFePO_4$ Cell"**, M. Safari and C. Delacourt, *J. Electrochem. Soc.*, **158(10)**, A1123-A1135 (2011)

29. **"Measurement of Lithium Diffusion Coefficient in Li_yFeSO_4F"**, C. Delacourt, M. Ati, and J. M. Tarascon, *J. Electrochem. Soc.*, **158(6)**, A741-A749 (2011)

28. **"Analysis of Lithium Deinsertion/Insertion in Li_yFePO_4 With a Simple Mathematical Model"**, C. Delacourt and M. Safari, *Electrochim. Acta*, **56**, 5222-5229 (2011)

27. **"Modeling of a Commercial Graphite/$LiFePO_4$ cell"**, M. Safari and C. Delacourt, *J. Electrochem. Soc.*, **158(5)**, A562-A571 (2011)

26. **"Ionic Liquid Made $LiZnSO_4F$: A New Ceramic Electrolyte Composite for Solid-State Li-Batteries"**, P. Barpanda, J. N. Chotard, C. Delacourt, M. Reynaud, Y. Filinchuk, M. Armand, M. Deschamp, and J. M. Tarascon, *Angew. Chem. Int. Ed.*, **50**, 2526-2531 (2011)

25. **"Mathematical Modeling of Lithium Iron Phosphate Electrode : Galvanostatic Charge/Discharge and Path Dependence"**, M. Safari and C. Delacourt, *J. Electrochem. Soc.*, **158(2)**, A63-A73 (2011)

24. **"Mathematical Modeling of CO_2 Reduction to CO in Aqueous Electrolytes. Part II.- Study of an Electrolysis Cell Making Syngas (CO + H_2) from CO_2 and H_2O Reduction at Room Temperature"**, C. Delacourt and J. Newman, *J. Electrochem. Soc.*, **157(12)**, B1911-B1926 (2010)

23. **"Mathematical Modeling of CO_2 Reduction to CO in Aqueous Electrolytes. Part I.- Kinetic Study on Planar Silver and Gold Electrodes"**, Charles Delacourt, Paul Ridgway, and John Newman, *J. Electrochem. Soc.*, **157(12)**, B1902-B1910 (2010)

22. **"Structural and Electrochemical Investigation of Novel $AMSO_4F$ (A = Na, Li ; M = Fe, Co, Ni, Mn) Metal Fluorosulphates Prepared Using Low Temperature Synthesis Routes"**, Prabeer Barpanda, Jean-Noël Chotard, Nadir Recham, Charles Delacourt, Mohamed Ati, Loic Dupont, Michel Armand, and Jean-Marie Tarascon, *Inorg. Chem.*, **49(16)**, 7401-7413 (2010)

21. **"Life-Prediction Methods for Lithium-Ion Batteries Derived from a Fatigue Approach. Part II. Capacity-loss prediction of batteries subjected to complex current profiles"**, M. Safari, M. Morcrette, A. Teyssot, and C. Delacourt, *J. Electrochem. Soc.*, **157(7)**, A892-A898 (2010)

20. **"Life-Prediction Methods for Lithium-Ion Batteries Derived from a Fatigue Approach. Part I. Introduction : Capacity-Loss Prediction Based on Damage Accumulation"**, M. Safari, M. Morcrette, A. Teyssot, and C. Delacourt, *J. Electrochem. Soc.*, **157(6)**, A713-A720 (2010)

19. **"Thermal Modeling of a cylindrical $LiFePO_4$/Graphite Lithium-ion Battery"**, Christophe Forgez, Dinh Vinh Do, Guy Friedrich, Mathieu Morcrette, and Charles Delacourt, *J. Power Sources*, **195(9)**, 2961-2968 (2010)

18. **"A 3.6 V lithium-based fluorosulphate insertion positive electrode for lithium-ion batteries"**, N. Recham, J-N. Chotard, L. Dupont, C. Delacourt, W. Walker, M. Armand, and J. M. Tarascon, *Nature Mater.*, **9**, 68 - 74 (2009)

17. **"Lithium insertion mechanism in crystalline and amorphous $FePO_4 \cdot nH_2O$"**, Charles Delacourt, Philippe Poizot, Dominique Bonnin, and Christian Masquelier, *J. Electrochem. Soc.*, **156(7)**, A595-A605 (2009)

16. **"Multimodal physics-based aging model for life prediction of Li-ion batteries"**, M. Safari, M. Morcrette, A. Teyssot, and C. Delacourt, *J. Electrochem. Soc.*, **156(3)**, A145-A153 (2009)

15. **"Mathematical modeling of cation contamination in a proton-exchange membrane"**, A. Z. Weber and C. Delacourt, *Fuel Cells*, **8(6)**, 459-465 (2008)

14. **"Mathematical Modeling of a Cation-Exchange Membrane Containing Two Cations"**, C. Delacourt and J. Newman, *J. Electrochem. Soc.*, **155(11)**, B1210-B1217 (2008)

13. **"Design of an electrochemical cell making syngas (CO + H_2) from CO_2 and H_2O reduction at room temperature"**, C. Delacourt, P. L. Ridgway, J. B. Kerr, and J. Newman, *J. electrochem. Soc.*, **155(1)**, B42-B45 (2008)

12. **"Development and implementation of a high-temperature electrochemical cell for lithium batteries"**, D. Munoz-Rojas, J. B. Leriche, C. Delacourt, P. Poizot, M. Rosa Palacin, and J. M. Tarascon, *Electrochem. Comm.*, **9**, 708-712 (2007)

11. **"Study of the $LiFePO_4$/$FePO_4$ two-phase system by High Resolution Electron Energy Loss Spectroscopy"**, L. Laffont, C. Delacourt, P. Gibot, M. Y. Wu, P. Kooyman, C. Masquelier, and J. M. Tarascon, *Chem. Mater.* **18(23)**, 5520-5529 (2006)

10. **"Size effects on carbon-free $LiFePO_4$ powders : the key to superior energy density"**, C. Delacourt, P. Poizot, S. Levasseur, and C. Masquelier, *Electrochem. Solid State Lett.*, **9(7)**, A352-A355 (2006)

9. **"Electrochemical and electrical properties of Nb- and/or C-containing $LiMPO_4$ composites (M = Fe, Mn)"**, C. Delacourt, C. Wurm, L. Laffont, J. B. Leriche, and C. Masquelier, *Solid State Ionics*, **177**, 333–341 (2006)

8. **"Energetics of $LiFePO_4$ and polymorphs of its delithiated form, $FePO_4$"**, R. G. Iyer, C. Delacourt, C. Masquelier, J. M. Tarascon and A. Navrotsky, *Electrochem. Sol. State Lett.*, **9(2)**, A46–A48 (2006)

7. **"Crystal chemistry of the olivine-type Li_xFePO_4 system ($0 \leq x \leq 1$) between 25 and 370°C"**, Charles Delacourt, Juan Rodriguez-Carvajal, Bernd Schmitt, Jean-Marie Tarascon, and Christian Masquelier, *Solid State Science*, **7(12)**, 1506–1516 (2005)

6. **"The existence of a temperature-driven solid solution for $0 \leq x \leq 1$ in Li_xFePO_4"**, C. Delacourt, P. Poizot, C. Masquelier, and J. M. Tarascon, *Nature Mater.*, **4(3)**, 154-160 (2005)

5. **"Towards the understanding of electrical limitations in $LiMPO_4$ (M = Fe, Mn) electrode materials"**, C. Delacourt, L. Laffont, R. Bouchet, C. Wurm, J. B. Leriche, M. Morcrette, J. M. Tarascon, and C. Masquelier, *J. Electrochem. Soc.*, **152(5)**, A913–A921 (2005)

4. **"Various strategies to tune the ionic/electronic properties of electrode materials"**, J. M. Tarascon, C. Delacourt, A. S. Prakash, M. Morcrette, M. S. Hegde, C. Wurm, and C. Masquelier, *Dalton Trans.*, **19**, 2988 (2004)

3. **"Low temperature preparation of optimized phosphates for Li-Battery applications"**, C. Delacourt, C. Wurm, P. Reale, M. Morcrette, and C. Masquelier, *Solid State Ionics*, **173**, 113-118 (2004)

2. **"One-Step Low-Temperature Route for the Preparation of Electrochemically Active $LiMnPO_4$ Powders"**, C. Delacourt, P. Poizot, M. Morcrette, J. M. Tarascon, and C. Masquelier, *Chem. Mater.*, **16**, 93-99 (2004)

1. **"Synthesis and Thermal Behavior of Crystalline Hydrate Iron(III) Phosphates of Interest as Positive Electrodes in Li Batteries"**, P. Reale, B. Scrosati, C. Delacourt, C. Wurm, M. Morcrette, and C. Masquelier, *Chem. Mater.*, **15**, 5051-5058 (2003)

PROCEEDINGS

7. **"Studying the inhomogeneous aging behavior in commercial Li-ion batteries"**, V. Nehru Bandla, J. Bernard, C. Delacourt, M. Morcrette, M. Petit, *2017 IEEE Vehicle Power and Propulsion Conference*

6. **"Mathematical Modeling of a Cylindrical Graphite/$LiFePO_4$ Cell : Focus on the $LiFePO_4$ Electrode"**, M. Safari and C. Delacourt, *Proceedings of the 9th European Symposium on Electrochemical Engineering* (2012)

5. **"Synthesis of new fluorosulphate materials using different approaches"**, M. Ati, M-T. Sougrati, N. Recham, P. Barpanda, M. Reynaud, C. Delacourt, M. Armand, J-C. Jumas, and J-M. Tarascon, *ECS Transactions*, **35(32)**, 57-63 (2011)

4. **"Study of graphite/NCA Li-ion Cell Degradation During Accelerated Aging Tests – Data Analysis of the SimStock Project"**, Weiping Liu, Charles Delacourt, Christophe Forgez and Serge Pélissier, *2011 IEEE Vehicle Power and Propulsion Conference*

3. **"Development of an Electrochemical Battery Model and its Parameters Identification Tool"**, Julien Hafsaoui, Julien Scordia, Franck Sellier, Weiping Liu, Charles Delacourt, and Philippe Aubret, *Journal of Society of Automotive Engineers of Japan*, Paper Number : 20105152, No.86-10 (2009)

2. **"Optimisation multi-objectifs de paramètres d'un modèle physico-chimique pour accumulateur Li-ion"**, Weiping Liu and Charles Delacourt, *Electrotechnique du futur 2009*, UTC Compiègne (2009)

1. **"Electrochemical and electrical properties of Nb- and/or C-containing $LiFePO_4$ composites"**, C. Delacourt, C. Wurm, L. Laffont, F. Sauvage, J. B. Leriche, R. Bouchet, M. Morcrette, J. M. Tarascon and C. Masquelier, *Mater. Res. Soc. Symp. Proc. Vol.*, **835**, 321–326 (2005)

PATENTS

4. **"PROCEDE DE CARACTERISATION D'UNE ORIENTATION PREFERENTIELLE D'UN ENSEMBLE DE PARTICULES D'UNE ELECTRODE D'UN SYSTEME ELECTROCHIMIQUE"**
S. Malifarge, B. Delobel, and C. Delacourt
French Patent, FR 3058224 (2018)

3. **"Preparation of lithium-transition metal mixed silicate for use as active material in positive electrodes for rechargeable batteries"**
G. Quoirin, J. -M. Tarascon, C. Masquelier, C. Delacourt, P. Poizot, and F. Taulelle
World Patent, WO 2008107571 (A2) (2008)

2. **"Silicates mixtes de lithium"**
G. Quoirin, J. -M. Tarascon, C. Masquelier, C. Delacourt, P. Poizot, et F. Taulelle
French Patent, FR 0700932 (2007)

1. **"Crystalline nanometric $LiFePO_4$"**
C. Delacourt, P. Poizot, and C. Masquelier
World Patent, WO 2007000251 (2007)

INVITED ORAL COMMUNICATIONS IN MEETINGS

30. **"Modeling of high-energy density negative electrodes for Lithium-ion batteries"**, S. Malifarge, B. Delobel, and C. Delacourt, Invited presentation, CECAM workshop : Electrochemical Energy Storage ; Theory Meets Industry, Paris, France, June 12-14, 2019

29. **"Modélisation électrochimique des batteries à ions lithium"**, M. Farkhondeh, M. Pritzker, M. Fowler, M. T. Dinh Nguyen, S. Malifarge, B. Delobel, G. Assat, D. Alves Dalla Corte, J. M. Tarascon, and C. Delacourt, Invited presentation, GFECI 2017, Saint-Dié-des-Vosges, France, March 20-23, 2017

28. **"Methods coupling experiments and modeling for the determination of interfacial, porous-electrode, and electrolyte properties"**, M. Farkhondeh, M. Pritzker, M. Fowler, M. Safari, M. T. Dinh Nguyen, S. Malifarge, B. Delobel, C. Delacourt, Invited presentation, Batteries 2016, Nice, France, Sep. 28-30, 2016

27. **"Mathematical Modeling as a Tool for Performance and Aging Analysis of Li-Ion Batteries"**, C. Delacourt, Keynote presentation, XXXI Congreso Nacional de la Sociedad Mexicana de Electroquímica (SMEQ) and 9th Meeting of the Mexican Section of the Electrochemical Society, Monterrey, Mexico, May 30-June 3, 2016

26. **"Physics-based modeling applied to Li-ion batteries"**, C. Delacourt, Invited keynote presentation, Advanced Battery Power Conference, Aachen, Germany, Apr 27-29, 2015

25. **"A Physics-Based Methodology for Life Prediction of Li-ion Batteries"**, C. Delacourt and M. Safari, Invited oral presentation, 64^{th} annual meeting of the International Society of Electrochemistry, Santiago de Queretaro, Mexico, Sept 8-13, 2013

24. **"Investigation of Li+ insertion/extraction mechanisms in polyanion-based positive electrodes for Li batteries"**, C. Masquelier, S. Hamelet, C. Delacourt, M. Casas Cabanas, R. Dominko, and L. Croguennec, Invited oral presentation, Workshop on the use of Neutrons for Energy, Delft, Netherlands, Sep 17, 2012

23. **"Crystal chemistry of phosphates, silicates and fluorophosphates, hosts for the reversible electrochemical insertion/extraction of lithium"**, C. Masquelier, S. Hamelet, C. Delacourt, M. Casas Cabanas, R. Dominko, and L. Croguennec, Invited oral presentation, Gordon Conference on Solid State Chemistry, Colby Sawyer College, New London, USA, Jul 25, 2012

22. **"Aging of Li-ion batteries : Experiments and Modeling"**, C. Delacourt and M. Safari, Invited oral presentation, ModVal 9, Campus Sursee, Switzerland, Apr 2-4, 2012

21. **"Life prediction of Li-ion batteries using experiments and modeling"**, C. Delacourt and M. Safari, Invited oral presentation, YESS Symposium, Berkeley, CA, USA, Mar 20-22, 2012

20. **"Fluorosulfates : An Endless Family of Electrode Materials"**, J.M. Tarascon, C. Delacourt, P. Barpanda, M. Ati, B. Melot, J.N. Chotard, G. Rousse, M. Armand, and N. Recham, Invited oral presentation, 220^{th} meeting of the Electrochemical Society, Boston, MA, USA, Oct 9-14, 2011

19. **"Mathematical Modeling of a cylindrical graphite/$LiFePO_4$ cell : Focus on the $LiFePO_4$ electrode"**, M. Safari and C. Delacourt, Invited oral presentation, keynote lecture of the Carl Wagner medal award winner, 9^{th} European Symposium on Electrochemical Engineering, Chania, Crete, Greece, June 19-23, 2011

18. **"Life prediction of lithium-ion batteries"**, M. Safari, M. Morcrette, A. Teyssot, and C. Delacourt, Invited oral presentation, 61^{st} Annual Meeting of the International Society of Electrochemistry, Nice, France, Sept 26-Oct 1^{st}, 2010

17. **"Development of modeling tools for life prediction of lithium-ion batteries"**, M. Safari, M. Morcrette, A. Teyssot, and C. Delacourt, Invited oral presentation, abaa-3, 3^{rd} meeting on advanced batteries for automobile applications, Seoul, Korea, Sept 8-10, 2010

16. **"Mathematical Modeling of Electrochemical Systems. Application to Li-ion Batteries Aging"**, M. Safari, M. Morcrette, A. Teyssot, and C. Delacourt, Invited oral presentation, CIMTEC, 12^{th} International Ceramics Congress, Montecatini Terme, Italy, June 6-11, 2010

15. **"Fluorine-based Electrodes for Li-ion Batteries"**, J. M. Tarascon, N. Recham, P. Barpanda, J-N. Chotard, C. Delacourt, M. Ati, and M. Armand, Invited oral presentation, Workshop on Fluorinated Materials & Energy Conversion (FMEC-2010), ICMCB, Bordeaux, France, April 12-13, 2010

14. **"Crystal chemistry of transition metal phosphates used as positive electrodes in lithium batteries"**, C. Masquelier, C. Delacourt, S. Patoux, C. Wurm, P. Gibot, M. Casas, G. Rousse, M. Morcrette, P. Poizot, and J. M. Tarascon, Invited oral presentation, XXXI Bienal de Quimica, Toledo, Spain, Sept 12, 2007

13. **"Lithium insertion/extraction into iron phosphates and silicates"**, C. Masquelier, C. Delacourt, P. Gibot, L. Dupont, L. Laffont, G. Quoirin, and F. Taulelle, Invited oral presentation, 4^{th} ICMAT, Singapore, July, 2007

12. **"Lithium insertion/extraction into Fe phosphate : a structural perspective"**, C. Masquelier, C. Delacourt, and P. Gibot, Invited oral presentation, 24^{th} International Battery Seminar, Fort Lauderdale, FL, USA, March 19-22, 2007

11. **"Lithium insertion/extraction into transition metal phosphates : a structural perspective"**, C. Masquelier, C. Delacourt, P. Poizot, and S. Patoux, Invited oral presentation, International Symposium on Structure-Property relationships in Solids, Bordeaux, France, June 29, 2006

10. **"Apport de la diffraction des rayons X ou des neutrons à l'électrochimie des solides inorganiques : cas des matériaux d'électrodes pour accumulateurs au lithium"**, C. Masquelier, C. Delacourt, and S. Patoux, Invited oral presentation, Rencontres LLB-Soleil, Saclay, France, March 2-3, 2006

9. **"New insights into the electrochemistry and crystal chemistry in the $LiMPO_4/MPO_4$ system (M = Fe, Mn)"**, C. Masquelier, C. Delacourt, P. Poizot, and J. M. Tarascon, Invited oral presentation, RSC Meeting on Solid State Chemistry, Surrey, UK, Dec 21-22, 2005

8. **"Low temperature precipitation techniques as a tool for the preparation of $LiMPO_4$ particles with enhanced electrochemical activity"**, C. Delacourt, P. Poizot, J. M. Tarascon, and C. Masquelier, Invited oral presentation, 208^{th} Meeting of the Electrochem. Soc., Los Angeles, CA, USA, Oct 16-21, 2005

7. **"Recent advances in olivine-type phosphates : new insights into $LiMPO_4$-based positive electrodes (M = Fe, Mn) for lithium-ion batteries"**, C. Masquelier, C. Delacourt, C. Wurm, and J. M. Tarascon, Invited oral presentation, International conference "Batteries 2005", Paris, France, June 14, 2005

6. **"Recent fundamental advances in $LiFePO_4$ research"**, C. Masquelier, C. Delacourt, P. Poizot, and J. M. Tarascon, Invited oral presentation, "keynote", 3^{rd} Lithium Battery Discussions, Arcachon, France, June 2, 2005
5. **"New insights into the phase stability in the $LiFePO_4$ / $FePO_4$ system"**, C. Masquelier, C. Delacourt, P. Poizot, J. Rodriguez-Carvajal, and J. M. Tarascon, Invited oral presentation + poster, 3^{rd} Lithium Battery Discussions, Arcachon, France, May 22-25, 2005
4. **"Recent findings on the crystal chemistry of Li_xFePO_4"**, C. Delacourt, P. Poizot, J. M. Tarascon, and C. Masquelier, Invited oral presentation, 2^{nd} franco-chinese workshop on mat. for adv. Electrochem. Syst., Bordeaux, France, April 8, 2005
3. **"Redox chemistry in the Li-Fe-P-O system"**, C. Masquelier, C. Delacourt, C. Wurm, L. Laffont, M. Morcrette, and J. M. Tarascon, Invited oral presentation, 206^{th} Electrochemical society Meeting, Honolulu, HI, USA, Oct 2004
2. **"Synthesis of Fe and Mn-containing $LiMPO_4$ phosphates for Li-battery applications"**, C. Masquelier, C. Delacourt, C. Wurm, L. Laffont, and M. Morcrette, Invited oral presentation, 12^{th} Int. Meeting on Lithium Batteries, Nara, Japan, Jun 2004
1. **"Low temperature preparation of optimized phosphates for Li-battery applications"**, C. Masquelier, C. Delacourt, C. Wurm, L. Laffont, P. Poizot, M. Morcrette, and J. M. Tarascon, Invited oral presentation, European MRS Meeting, Strasbourg, France, May 2004

ORAL COMMUNICATIONS IN MEETINGS

32. **"Determination of the Transport Properties of Liquid Electrolytes Using a Multi-Electrode Cell"**, C. Rabette, T. Lombard, J. P. Chehab, M. Farkhondeh, B. Fleutot, and C. Delacourt, Meet. Abstr. MA2020-01 132
31. **"Resolving the Discrepancy in Tortuosity Determination for Battery Porous Electrodes Via a Numerical Approach"**, T. T. Nguyen, A. Demortiere, B. Fleutot, B. Delobel, S. J. Cooper, and C. Delacourt, Meet. Abstr. MA2020-01 2724
30. **"Studying the internal inhomogeneous aging behavior inside commercial lithium ion batteries"**, V. Nehru Bandla, J. Bernard, C. Delacourt, M. Morcrette, M. Petit, Oral presentation, Advanced Battery Power Conference, Munster, Germany, Apr. 10-11, 2018
29. **"Studying the inhomogeneous aging behavior in commercial Li-ion batteries"**, V. Nehru Bandla, J. Bernard, C. Delacourt, M. Morcrette, M. Petit, Oral presentation, IEEE Vehicle Power and Propulsion Conference, Belfort, France, Dec 11-14, 2017
28. **"Influence of the design of high-energy-density graphite negative electrodes on the electrochemical performance"**, S. Malifarge, A. A. Franco, B. Delobel, and C. Delacourt, Oral presentation, 232nd Meeting of the electrochemical Society, National Harbor, MD, USA, Oct 1-5, 2017
27. **"Charge compensation and electrochemical kinetics in Li-rich layered cathodes : From practical to model systems"**, Gaurav Assat, Antonella Iadecola, Dominique Foix, Rémi Dedryvère, Charles Delacourt, and Jean-Marie Tarascon, Oral presentation + poster, Lithium Battery Discussions "Electrode Materials", Arcachon, France, June 11-16, 2017
26. **"Methods coupling experiments and modeling for the determination of interfacial, porous-electrode, and electrolyte properties"**, M. Farkhondeh, M. Pritzker, M. Fowler, M. Safari, M. T. Dinh Nguyen, S. Malifarge, B. Delobel, G. Assat, D. Alves Dalla Corte, J. M. Tarascon, and C. Delacourt, Oral presentation, Advanced Battery Power Conference, Aachen, Germany, March 28-30, 2017
25. **"SEI characterisation using ferrocene/ferrocenium as Redox Shuttle"**, M. T. Dinh Nguyen and C. Delacourt, Oral presentation, 229^{th} meeting of the Electrochemical Society, San Diego, CA, May 30-June 3, 2016
24. **"Influence of the design of high-energy-density graphite negative electrodes on the electrochemical performance"**, S. Malifarge, B. Delobel, A. A. Franco, and C. Delacourt, Oral presentation, SIRBATT workshop "Controlling Lithium Battery Interfaces", Orlando, FL, USA, May 27, 2016
23. **"Electrochemical Characterisations of the SEI Using Ferrocene/Ferrocenium : Experimental and Theoretical Investigation"**, M. T. Dinh Nguyen and C. Delacourt, Oral presentation, SIRBATT workshop "Understanding Lithium Battery Interfaces", Bilbao, Spain, Sep 29, 2015
22. **"Memory-Effect in Li-Ion Battery Electrodes Unraveled"**, M. Farkhondeh, M. Pritzker, M. Fowler, M. Safari, and C. Delacourt, Oral presentation, 227^{th} meeting of the Electrochemical Society, Chicago, IL, May 24-28, 2015
21. **"Etude de la contamination de l'interphase solide électrolyte par du manganèse dans les batteries à ions lithium"**, C. Delacourt, A. Kwong, X. Liu, W. Yang, P. Lu, S. J. Harris, and V. Srinivasan, Oral presentation, Journées d'Electrochimie 2013, Paris, France, July 8-12, 2013
20. **"Impact of Mn Dissolution in Lithium Manganese Oxides on the SEI Formation"**, Peng Lu, Chen Li, Zicheng Li, Charles Delacourt, and Stephen J. Harris, Oral presentation, 223^{th} meeting of the Electrochemical Society, Toronto, ON, Canada, May 12-16, 2013

19. **"Calendar aging and post mortem analysis of Graphite/$LiFePO_4$ cell"**, M. Kassem, J. Bernard, R. Revel, S. Pélissier, F. Duclaud, and C. Delacourt, Oral presentation, The Energy and Materials Research Conference 2012, Torremolinos, Malaga, Spain, Jun 20-22, 2012

18. **"Li Transport properties in Li_yFeSO_4F"**, C. Delacourt, M. Ati, and J. M. Tarascon, Oral presentation, 220^{th} meeting of the Electrochemical Society, Boston, MA, USA, Oct 9-14, 2011

17. **"Ionic Liquid Grafting as a Novel Route to Design Solid-electrolyte for Li-batteries"**, P. Barpanda, J. N. Chotard, C. Delacourt, M. Reynaud, M. Armand, and J. M. Tarascon, Oral presentation, International Conference on Materials for Advanced Technologies 2011, Singapore, June 26-July 1st, 2011

16. **"Charge/Discharge Simulation of an All-Solid-State Thin-Film Battery Using a One-Dimensional Model"**, S. D. Fabre, D. Guy-Bouyssou, F. Le Cras, and C. Delacourt, Oral presentation, 219^{th} meeting of the Electrochemical Society, Montreal, Canada, May 1-6, 2011

15. **"Aging of a Commercial $LiFePO_4$/Graphite Cell under Different Cycling and Storage Conditions : Experiments and Modeling"**, M. Safari, M. Morcrette, A. Teyssot, and C. Delacourt, Oral presentation, 219^{th} meeting of the Electrochemical Society, Montreal, Canada, May 1-6, 2011

14. **"Analysis of Lithium Insertion/Deinsertion in $LiFePO_4$ With a Simple Mathematical Model"**, C. Delacourt and M. Safari, Oral presentation, 218^{th} meeting of the Electrochemical Society, Las Vegas, NV, USA, Oct 10-15, 2010

13. **"Modeling of a commercial Graphite/$LiFePO_4$ cell"**, M. Safari, M. Morcrette, A. Teyssot, and C. Delacourt, Oral presentation, 218^{th} meeting of the Electrochemical Society, Las Vegas, NV, USA, Oct 10-15, 2010

12. **"The impact of downsizing $LiFePO_4$ particles to nanoscale : a key step for new generations of Li-ion batteries"**, C. Masquelier, S. Hamelet, P. Gibot, C. Delacourt, and S. Levasseur, Oral presentation, World Conference on Powder Technology, Delft Technical University, April 24, 2010.

11. **"Capacity-fade simulations of Li-ion batteries under various current profiles"**, M. Safari, M. Morcrette, A. Teyssot, C. Delacourt, Oral presentation, 216^{th} meeting of the Electrochemical Society, Vienna, Austria, October 4-9, 2009.

10. **"Modeling of lithium-ion batteries aging"**, M. Safari, M. Morcrette, A. Teyssot, and C. Delacourt, Oral presentation, 215^{th} meeting of the Electrochemical Society, San Francisco, CA, May 24-29, 2009.

9. **"New mechanism of Li^+ insertion/extraction in $Li_xFe_yPO_4$"**, C. Masquelier, S. Hamelet, P. Gibot, M. Casas Cabanas, C. Delacourt, L. Laffont, and J. M. Tarascon., Oral presentation, MRS Fall Meeting, Boston, USA, Nov. 30- Dec. 4, 2008.

8. **"Single-phase mechanism of Li^+ insertion/extraction from $Li_xFe_yPO_4$ nanoparticles"**, C. Masquelier, S. Hamelet, P. Gibot, M. Casas Cabanas, C. Delacourt, L. Laffont, J. M. Tarascon., Oral presentation, Franco-Japanese Workshop, Thiais, France, Sept. 20-23, 2008.

7. **"Spectacular behaviour of "nano" $LiFePO_4$ powders"**, C. Masquelier, S. Hamelet, P. Gibot, M. Casas Cabanas, C. Delacourt, L. Laffont, and J. M. Tarascon., Oral presentation, Hot nano topics, Portoroz, Slovenia, May 26-29, 2008.

6. **"New Compositions, New Mechanisms of Li Extraction in $LiFePO_4$-based Electrodes"**, C. Masquelier, S. Hamelet, P. Gibot, M. Casas Cabanas, C. Delacourt, L. Laffont, and J. M. Tarascon, Oral presentation, 25th International Battery Seminar & Exhibit, Fort Lauderdale, USA, March 17-20, 2008.

5. **"Photons to Fuels : Design of an electrochemical cell making syngas ($CO + H_2$) from CO_2 and H_2O at RT"**, C. Delacourt, P. L. Ridgway, J. B. Kerr, and J. Newman, Oral presentation, 212^{th} meeting of the Electrochemical Society, Washington, D.C., USA, Oct 8-12, 2007

4. **"The existence of a temperature-driven solid solution for $0 \leq x \leq 1$ in Li_xFePO_4"**, C. Delacourt, P. Poizot, J. M. Tarascon, and C. Masquelier, Oral presentation, 207^{th} Meeting of the Electrochemical Society, Quebec city, Canada, May 15-20, 2005

3. **"Etude des mécanismes d'extraction/insertion de lithium depuis/dans $LiMPO_4$ (M = Fe, Mn, Co)"**, C. Delacourt, L. Laffont, C. Wurm, P. Poizot, M. Morcrette, J. M. Tarascon, and C. Masquelier, Oral presentation, Groupement Français d'Etude des Composés d'Insertion (GFECI), Lacanau, France, Mar 23-25, 2004

2. **"A one step low-temperature route for the preparation of electrochemically active $LiMnPO_4$"**, C. Delacourt, P. Poizot, M. Morcrette, J. M. Tarascon, and C. Masquelier, Oral presentation + poster, 2^{nd} Lithium Battery Discussions (LiBD), Arcachon, France, Sept 14-19, 2003

1. **"Thermodynamics and Kinetics of phase formations in the Fe_2O_3 - P_2O_5 - H_2O system"**, C. Delacourt, P. Poizot, P. Reale, M. Morcrette, and C. Masquelier, Oral presentation + poster, 2^{nd} Lithium Battery Discussions (LiBD), Arcachon, France, Sept 14-19, 2003

INVITED ORAL COMMUNICATIONS IN UNIVERSITIES/COMPANIES

23. **“Vieillissement des batteries Li-ion”**
C. Delacourt
Invited seminar, Total Energies Lubrifiants, Nanterre, France, Jan. 25, 2023

22. **“Determination of parameters for physics-based models of Li-ion batteries”**
C. Delacourt
Invited seminar, Technical University of Munich, Speakers’ series on “New Frontiers in Battery Science and Technology" 2019, Munich, Germany, May 10, 2019

21. **“Durability of Li-ion batteries”**
C. Delacourt
White paper lecture, RS2E fall meeting, Paris, France, Oct 18, 2018

20. **“Etude de la réactivité aux interfaces électrochimiques d’électrodes pour le stockage et la conversion d’énergie”**
C. Delacourt
`https://www.college-de-france.fr/site/jean-marie-tarascon/seminar-2018-03-12-17h30.htm`
Invited seminar at College de France, Paris, France, March 12, 2018

19. **“Model Experiments for the Determination of Physics-Based-Model Parameters”**
C. Delacourt
Invited seminar, RS2E fall meeting, Paris, France, Oct 16-17, 2017

18. **“Electrochemical methods for the determination of interfacial, porous-electrode, and electrolyte properties”**
C. Delacourt
Invited seminar, Chaire Chimie du solide et de l’énergie, Collège de France, Paris, France, July 17, 2017

17. **“Li-ion Batteries : Principles, Mathematical Modeling, and Applications”**
C. Delacourt
Invited seminar, Union des professeurs de physique et chimie, Villeneuve d’ascq, France, Apr 24, 2017

16. **“Durability of Li-ion cells”**
C. Delacourt
Invited seminar, EXIDE Technologies, Gennevilliers, France, Nov 9, 2016

15. **“Anionic Redox in Li-rich Layered Cathodes – From Fundamentals to Applications”**
G. Assat, C. Delacourt, D. A. Dalla Corte, J. M. Tarascon
Invited seminar, RS2E fall meeting, Paris, France, Oct 18, 2016

14. **“Principles, Methods, and Applications of Electrochemistry”**
C. Delacourt
Invited oral presentation, Chemistry Institute of Picardie, Amiens, France, Sep 18, 2015

13. **“Modeling-oriented approaches to study Li-ion-battery-related problems”**
C. Delacourt
Invited oral presentation, KTH, Stockholm, Sweden, May 27, 2014

12. **“Degradation Phenomena in LiBs : From Aging Tests on Commercial Cells to Model Experiments”**
C. Delacourt
Invited oral presentation, MEET, Münster, Germany, Oct 23, 2013

11. **“Degradation of Li-ion Batteries : Experiments and Mathematical Modeling”**
C. Delacourt
Invited oral presentation, LEPMI, Grenoble, France, Jun 7, 2013

10. **“Degradation of Li-ion Batteries : Experiments and Mathematical Modeling”**
C. Delacourt
Invited oral presentation, IMN, Nantes, France, May 23, 2013

9. **“Degradation of Li-ion Batteries : Experiments and Mathematical Modeling”**
C. Delacourt
Invited oral presentation, Material Science and Engineering Department, EPFL, Lausanne, Switzerland, May 3, 2013

8. **“Degradation phenomena in Li-ion batteries”**
C. Delacourt
Invited oral presentation, Molecular Foundry, LBNL, Berkeley, CA, USA, Dec 6, 2012

7. **“Toward Better Li-ion Cells for Automotive Applications”**
C. Delacourt
Invited oral presentation, Volkswagen and BASF science award in electrochemistry, Wolfsburg, Germany, Oct 22, 2012

6. **"Life Prediction of Graphite/$LiFePO_4$ Batteries"**
C. Delacourt and M. Safari
Invited oral presentation, BATT seminar series, LBNL, Berkeley, CA, USA, Apr 16, 2012

5. **"Physics-Based Modeling of Lithium-ion Batteries Aging"**
M. Safari, M. Morcrette, A. Teyssot, C. Delacourt
Invited oral presentation, Robert Bosch Research Center, Palo Alto, CA, USA, Jun 5, 2009

4. **"Low temperature precipitation techniques as a tool for the preparation of $LiMPO_4$ particles with enhanced electrochemical activity"**
C. Delacourt
Invited oral presentation, Umicore Scientific Award 2007, Brussels, Belgium, Dec. 4, 2007

3. **"Photons to Fuels : Design of an electrochemical cell making syngas (CO + H_2) from CO_2 and H_2O at room temperature"**
C. Delacourt, P. L. Ridgway, J. B. Kerr, and J. Newman
Invited oral presentation, BATT seminar series, LBNL, Berkeley, CA, USA, Sep 17, 2007

2. **"Photons to Fuels : Design of an electrochemical cell making syngas (CO + H_2) from CO_2 and H_2O"**
C. Delacourt, P. L. Ridgway, J. B. Kerr, and J. Newman
Invited oral presentation, Palo Alto Research Center (PARC), Palo Alto, CA, USA, Apr 30, 2007

1. **"Low temperature precipitation techniques as a tool for the preparation of LiMPO4 particles with enhanced electrochemical activity"**
C. Delacourt, P. Poizot, J. M. Tarascon, and C. Masquelier
Invited oral presentation, Polyplus Company, Berkeley, CA, USA, Oct 21, 2005

LECTURES IN SCHOOLS

1. **"Mathematical Modeling of Li-ion Batteries"**, C. Delacourt, Invited lecture, ENGINE winter school (Grenoble Energy Conversion & Storage), Grenoble, France, Feb 25 - Mar 1st, 2019

2. **"Continuum mathematical modeling of Li-ion batteries"**, C. Delacourt, Invited lecture, BATMAN summer school (Battery Modeling & Advanced Numerical Simulation), Amiens, France, July 4-8, 2016

3. **"Li-ion Batteries : Principles, Mathematical Modeling, and Applications"**, C. Delacourt, Invited lecture, Ecole d'hiver CO-DEGEPRA : Réactions et réacteurs hétérogènes, Les Houches (Chamonix), France, Mar 13-18, 2016

4. **"Calendar aging and post mortem analysis of Graphite/$LiFePO_4$ cells"**, C. Delacourt, Invited lecture, Postmortem summer school, Amiens, France, Jul 7-11, 2014

5. **"Durability of Li-ion Batteries"**, C. Delacourt, Invited lecture, BEST conference on fuel cells and batteries, Grenoble, France, Apr 28-29, 2014

POSTERS

14. **"Determination of the transport properties of liquid electrolytes for Li-ion batteries using a multi-electrode electrochemical cell"**
C. Rabette, I. Tekaya, M. Farkhondeh, B. Fleutot and C. Delacourt
Oxford Battery Modeling Symposium, Oxford, UK, Mar 27-28, 2023

13. **"Modeling of high-energy-density graphite negative electrodes"**
S. Malifarge, A. A. Franco, B. Delobel, and C. Delacourt
Advanced Battery Power Conference, "Modeling of high-energy-density graphite negative electrodes", Aachen, Germany, Mar 28-30, 2017

12. **"Anionic redox in Li-rich layered oxide cathodes : from fundamentals to applications by comparing 'model' vs. practical materials"**
G. Assat, D. Alves Dalla Corte, C. Delacourt, and J. M. Tarascon
Advanced Battery Power Conference, "Modeling of high-energy-density graphite negative electrodes", Aachen, Germany, Mar 28-30, 2017

11. **"Electrochemical characterization of the SEI using ferrocene as redox shuttle"**
M. T. Dinh Nguyen and C. Delacourt
SIRBATT workshop "Controlling Lithium Battery Interfaces", Orlando, FL, USA, May 27, 2016

10. **"SEI characterization using ferrocene/ferrocenium as a redox shuttle"**
M. T. Dinh Nguyen and C. Delacourt
Journees d'Electrochimie 2015, Rome, Italy, Jul 5-10, 2015

9. **"Life prediction of Li-ion batteries"**
C. Delacourt and M. Safari
Gordon Research Conference on Batteries, Ventura, CA, USA, Mar 4-9, 2012

8. **"Exploration of sodium metal fluorosulphate electrodes and their derivatives : Low temperature synthesis and characterisation"**
P. Barpanda, N. Recham, J-N. Chotard, C. Delacourt, M. Ati, W. Walker, M. Armand, and J-M. Tarascon
15^{th} International Meeting on Lithium Batteries (IMLB), Montréal, Canada, June 27-July 2, 2010

7. **"Fatigue Approach for Life-Prediction of Li-ion Batteries"**
M. Safari, A. Teyssot, M. Morcrette, and M. Safari
218^{th} meeting of the Electrochemical Society, Las Vegas, NV, USA, Oct 10-15, 2010

6. **"A mathematical model for impedance spectroscopy as a tool for studying the aging of Li-ion batteries"**
C. Delacourt
Int. Meeting on Lithium Batteries 2008, Tianjin, China, June 23-27, 2008

5. **"Photons to Fuels : Design of an electrochemical cell making syngas (CO + H_2) from CO_2 and H_2O"**
C. Delacourt, P. L. Ridgway, and J. Newman
BERC Energy Symposium, Berkeley, CA, USA, March 21, 2007

4. **"Size effects on carbon-free $LiFePO_4$ powders : the key for superior energy density"**
C. Delacourt, P. Poizot, P. Gibot, S. Levasseur, and C. Masquelier
13^{th} Int. Meeting on Lithium Batteries, Biarritz, France, June 18-23, 2006

3. **"On the use of XAS and Mössbauer spectroscopies for lithiated iron phosphates"**
C. Delacourt, D. Bonnin, P. Poizot, L. Laffont, and C. Masquelier
MRS Fall Meeting, Boston, MA, USA, Nov 28 - Dec 2, 2005

2. **"The crystal structures at $\sim$350°C of $Li_{0.50}FePO_4$ and $Li_{0.75}FePO_4$"**
C. Delacourt, J. Rodriguez Carvajal, P. Poizot, J. M. Tarascon, and C. Masquelier
207^{th} Meeting of the Electrochemical Society, Quebec city, Canada, May 15-20, 2005

1. **"Electrical conductivity of $LiMPO_4$-based olivines"**
C. Delacourt, C. Wurm, L. Laffont, F. Sauvage, J. B. Leriche, R. Bouchet, M. Morcrette, J. M. Tarascon, and C. Masquelier
MRS Fall Meeting, Boston, MA, USA, Nov 27 - Dec 3, 2004