

Curriculum Vitae

Francisco Muñoz Fraile

Instituto de Cerámica y Vidrio (CSIC)
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Education

- 2003 PhD in Inorganic Chemistry, University Autonomous of Madrid (Spain)
Dissertation title: Synthesis, structure and properties of nitrated phosphate glasses in the system $\text{Li}_2\text{O}-\text{Na}_2\text{O}-\text{PbO}-\text{P}_2\text{O}_5$
Date: September 12, 2003
- 1997 BS in Chemistry, University of Alicante (Spain)

Present position

Tenured Scientist (appointed September 2009).
Ceramics and Glass Institute, Spanish Research Council (CSIC).

Previous positions

- 2006-2009 Research contract, Ceramics and Glass Institute (CSIC), Madrid (Spain).
2005-2006 Marie Curie fellow (EU), Otto-Schott Institute, Jena (Germany).
2004-2005 ATER contract, University of Lille 1 (France).
2003-2004 Research contract CNRS-Ministry of Industry, University of Rennes 1 (France).
2000-2003 PhD student, Ceramics and Glass Institute (CSIC), Madrid (Spain).

Grants

I3P research contract at the Ceramics and Glass Institute of CSIC (Spain), 2006-2009 (3 years).
Marie-Curie research fellowship at the Otto Schott Institute, Friedrich-Schiller University of Jena (Germany), 2005-2006 (8 months).
CSIC-DFG Marina Bueno research grant for a stay in Otto Schott Institute, Friedrich-Schiller University of Jena, (Germany), 2007 (3 months).
CSIC-DFG Marina Bueno research grant for a stay in Otto Schott Institute, Friedrich Schiller University of Jena (Germany), 2002 (1 month).

Memberships

Spanish Society of Ceramics and Glass

Technical committee TC03 on the study of Glass Structure of the International Commission on Glass (www.icglass.org). Chair position of the committee from 2011 to 2013.

Projects as Principal Investigator

Title: Phosphate glasses for optics and high power laser applications (I-LINK+ 2014)
Funding organization: Spanish Research Council (CSIC)
Total amount: 24700 €
Years: 2015-2016

Title: Effect of processing on the structure and properties of glasses and glass-ceramics with photonic applications (MAT2013-48246-C2-1-P)
Funding organization: Ministry of Economy of Spain
Total amount: 97959 €
Years: 2014-2016

Title: Glassy materials for rechargeable lithium batteries (PIE 200960I125)
Funding organization: Spanish Research Council (CSIC)
Total amount: 30000 €
Years: 2010

Participation in research projects

Title: Design of a glass melting furnace with a high energy and environmental yielding
Funding organization: CDTI (Spanish centre for the industrial and technological development)
Years: 2013-2015
PI: Dra. Alicia Durán Carrera

Title: Improving the competitiveness of technical curricula reflecting the current needs of business practice (ITMS 26110230052)
Funding organization: European Union
Years: 2012-2013
Principal Investigator (PI): Prof. Tillová, Faculty of Electrical Engineering, University of Zilina (Slovakia)

Title: Improvement in quality, energy consumption and environmental aspects of a glass meeting furnace
Funding organization: CDTI (Spanish centre for the industrial and technological development)
Years: 2011-2013
PI: Dra. Alicia Durán Carrera

Title: Structural bases of transport properties of glasses with technological interest (MAT2010-20459)
Funding organization: Ministry of Science
Years: 2011-2013
PI: Dr. María Jesús Pascual Francisco

Title: Development of new electrolyte and electrode materials for all-solid-state thin-film lithium batteries through solution process
Funding organization: Ministry of Science (Spain – Japan)
Years: 2009 - 2012
PI: Dr. Masahiro Tatsumisago, Dr. Mario Aparicio Ambrós

Title: Nano-composite phosphoborosilicate glasses for sealing applications MEC-CNRS (HF2007-0101)
Funding organization: Ministry of Education
Years: 2008-2009
PI: Dr. Lionel Montagne, Dr. Alicia Durán Carrera

Title: Glasses and glass-ceramics for efficient, clean and safe energies (MAT2006-4375)
Funding organization: Ministry of Science
Years: 2007-2009
PI: Dr. Alicia Durán Carrera

Title: Interface Controlled Nucleation and Crystallisation (INTERCONY) (STREP FP6-NMP3-CT-2006-033200)

Funding organization: European Commission
Years: 2007-2009
PI: Dr. Christian Russel

Title: Modelización de procesos de sinterización de materiales vítreos y vitrocerámicos (CSIC-CNPq 2004BR-0011)

Funding organization: Ministry of Education
Years: 2004-2006

PI: Dra. Alicia Durán Carrera, Dr. Edgar Dutra Zanotto

Title: Corrosion resistant glasses and glass-ceramics (MAT2003-05902-C02-01)

Funding organization: CICYT Spain

Years: 2004-2006

PI: Dra. Alicia Durán Carrera

Title: Anisotropic Glass Fibres Marie Curie Host Fellowship HPMD-CT-2001-00076

Funding organization: European Commission

Years: 2002-2006

PI: Dr. Christian Rüssel

Title: New formulations of inorganic UV-absorbers to prevent the photodegradation of wood.

Funding organization: Ministère de l'Industrie (France)

Years: 2002-2006

PI: Dr. Roger Marchand

Title: Development of glassy seals and enamels against corrosion (MAT2000-0952-C02-01)

Funding organization: CICYT Spain

Years: 2001-2003

PI: Dra. Alicia Durán Carrera

Title: Influence of viscosity and structure on nitridation of phosphate glasses (HF1998-069)

Funding organization: Integrated Action Spain-France, Ministry of Education - Universidad de Rennes 1

Years: 1999-2000

PI: Dra. Alicia Durán Carrera, Dr. Roger Marchand

Title: Influence of viscosity and structure on nitridation of phosphate glasses (2000-FR-009)

Funding organization: Integrated Action Spain-France, CSIC - CNRS

Years: 2001-2002

PI: Dra. Alicia Durán Carrera, Dr. Roger Marchand

Title: Crystallization processes in glasses (HA-2000-61)

Funding organization: Integrated Action Spain-Germany

Years: 2001-2002

PI: Dra. Alicia Durán Carrera, Dr. Christian Rüssel

Title: Sealing of non-oxidic ceramics (HF2001-124)

Funding organization: Integrated Action Spain-France, CSIC-CNRS

Years: 2002-2003

PI: Dra. Alicia Durán Carrera

Publications (peer-reviewed in SCI-indexed journals)

48. N. Mascaraque, A. Durán, F. Muñoz, Effect of nitrogen and fluorine on the chemical properties of lithium phosphate glasses, *J. Non-Cryst. Solids* (submitted).
47. N. Mascaraque, G. Tricot, A. Durán, F. Muñoz, New structural features of LiPON glasses determined by 1D and 2D ^{31}P MAS NMR, (submitted).
46. I. Kansal, A.A. Reddy, F. Muñoz, S.-J. Choi, H.-W. Kim, D.U. Tulyaganov, J.M. Ferreira, Structure, biodegradation behavior and cytotoxicity of alkali-containing silicophosphate glasses, *Mat. Sci. Eng. C* 44 (2014) 159-165.
45. N. Mascaraque, H. Takebe, G. Tricot, J.L.G. Fierro, A. Durán, F. Muñoz, Structure and electrical properties of a new thio-phosphorus oxynitride glass electrolyte, *J. Non-Cryst. Solids* 405 (2014) 159-162.
44. N. Mascaraque, G. Tricot, B. Revel, A. Durán, F. Muñoz, Nitrogen and fluorine anionic substitution in lithium phosphate glasses, *Solid State Ionics* 254 (2014) 40-47.
43. L. Muñoz-Senovilla, F. Muñoz, Viscosity behaviour of phosphate glasses through their short and intermediate range order structure, *J. Non-Cryst. Solids* 385 (2014) 9-16.
42. A. de Pablos-Martín, F. Muñoz, G.C. Mather, C. Patzig, S. Bhattacharyya, J.R. Jinschek, T. Höche, A. Durán, M.J. Pascual, KLaF_4 nano-crystallisation in oxyfluoride glass-ceramics, *Cryst. Eng. Comm.* 15(47) (2013) 10323-10332.
41. N. Mascaraque, J.L.G. Fierro, A. Durán, F. Muñoz, An interpretation for the increase of ionic conductivity by nitrogen incorporation in LiPON oxynitride glasses, *Solid State Ionics* 233 (2013) 73-79.
40. Peter Hockicko, Peter Bury, Francisco Muñoz, Investigation of relaxation and transport processes in LiPO(N) glasses, *J. Non-Cryst. Solids* 363 (2013) 140-146.
39. F. Muñoz, L. Montagne, L. Delevoye, T. Charpentier, New insights into the structure of NaPON oxynitride phosphate glasses by 17-Oxygen NMR, *J. Non-Cryst. Solids* 363 (2013) 134-139.
38. R. Wurth, M.J. Pascual, G.C. Mather, A. De Pablos-Martín, F. Muñoz, A. Durán, G. Cuello, C. Rüssel, Crystallisation mechanism of a multicomponent lithium aluminosilicate glass, *Mat. Chem. Phys.* 134 (2012) 1001-1006.
37. F. Muñoz, Comments on the structure of LiPON thin-film electrolytes, *J. Power Sources* 198 (2012) 432-433.
36. F. Muñoz, Kinetic analysis of the substitution of nitrogen for oxygen in phosphate glasses, *Phys. Chem. Glasses: Eur. J. Glass Sci. Technol. B*, 52(4) (2011) 181-186.
35. A. de Pablos-Martín, N. Hémono, G.C. Mather, S. Bhattacharyya, T. Höche, H. Bornhöft, J. Deubener, F. Muñoz, A. Durán, M.J. Pascual, Crystallisation Kinetics of LaF_3 nanocrystals in an oxyfluoride Glass, *J. Am. Ceram. Soc.* 94 (2011) 2420-2428.
34. N. Mascaraque, A. Durán, F. Muñoz, Effect of alumina on the structure and properties of $\text{Li}_2\text{O-B}_2\text{O}_3\text{-P}_2\text{O}_5$ glasses, *J. Non-Cryst. Solids*, 357 (2011) 3212-3220.
33. Q. Riguidel, F. Muñoz, Effect of nitridation on the aqueous dissolution of $\text{Na}_2\text{O-K}_2\text{O-CaO-P}_2\text{O}_5$ metaphosphate glasses, *Acta Biomaterialia*, 7 (2011) 2631-2636.
32. F. Muñoz, A. De Pablos-Martín, N. Hémono, M.J. Pascual, A. Durán, L. Delevoye, L. Montagne, NMR investigation of the crystallisation mechanism of LaF_3 and NaLaF_4 phases in aluminosilicate glasses, *J. Non-Cryst. Solids*, 357 (2011) 1463-1468.

31. C. Bocker, F. Muñoz, A. Durán, C. Rüssel, Fluorine sites in glasses and transparent glass-ceramics of the system $\text{Na}_2\text{O}/\text{K}_2\text{O}/\text{Al}_2\text{O}_3/\text{SiO}_2/\text{BaF}_2$, *J. Solid State Chem.*, 184 (2011) 405-410.
30. A. De Pablos-Martín, G.C. Mather, F. Muñoz, S. Bhattacharyya, Th. Höche, J.R. Jinschek, A. Durán, M.J. Pascual, Design of oxyfluoride glass-ceramics containing NaLaF_4 nanocrystals, *J. Non-Cryst. Solids*, 356 (2010) 3071-3079.
29. N. Hémono, F. Muñoz, Dissolution of SO_3 within a lithium phosphate glass network and structure-properties relationship, *Phys. Chem. Glasses: Eur. J. Glass Sci. Technol. B*, 51(2) (2010) 121-126.
28. A. Goel, D.U. Tulyagnov, M.J. Pascual, E.R. Shaaban, F. Muñoz, Z. Lü, J.M.F. Ferreira, Development and performance of diopside based glass-ceramic sealants for solid oxide fuel cells, *J. Non-Cryst. Solids*, 356 (2010) 1070-1080.
27. F. Muñoz, L. Montagne, L. Pascual, A. Durán, Composition and structure effects on the properties of lithium borophosphate glasses showing boron anomaly, *J. Non-Cryst. Solids*, 355 (2009) 2571-2577.
26. N. Hémono, G. Pierre, F. Muñoz, M.J. Pascual, A. Durán, Processing of transparent glass-ceramics by nanocrystallisation of LaF_3 , *J. Eur. Ceram. Soc.* 29 (2009) 2915-2920.
25. R. Würth, F. Muñoz, M. Müller, C. Rüssel, Crystal growth in a multicomponent lithia aluminosilicate glass, *Mat. Chem. Phys* 116 (2009) 433-437.
24. F. Moreau, A. Durán, F. Muñoz, Structure and properties of high Li_2O -containing aluminophosphate glasses, *J. Eur. Ceram. Soc.* 29 (2009) 1895-1902.
23. F. Muñoz, L. Montagne, L. Delevoye, Influence of phosphorus speciation on the phase separation of $\text{Na}_2\text{O}-\text{B}_2\text{O}_3-\text{SiO}_2$ glasses, *European Journal of Glass Science and Technology Part B: Phys. Chem. Glasses* 49(6) (2008) 339-345.
22. F. Muñoz, A. Durán, L. Pascual, L. Montagne, B. Revel, A.C.M. Rodrigues, Increased electrical conductivity of LiPON glasses produced by ammonolysis, *Solid State Ionics* 179 (2008) 574-579.
21. F. Tessier, F. Cheviré, F. Muñoz, O. Merdrignac-Conanec, R. Marchand, M. Bouchard, C. Colbeau-Justin, Powder preparation and UV absorption properties of selected compositions in the $\text{CeO}_2-\text{Y}_2\text{O}_3$ system, *J. Solid State Chem.* 181 (2008) 1204-1212.
20. F. Muñoz, O. Pritula, J. Sedláček and C. Rüssel, A study on the anisotropy of phosphate glass fibres, *European Journal of Glass Science and Technology Part A: Glass Technology*, 49(1) (2008) 47-52.
19. N. Hemono, J. Rocherullé, M. Le-Floch, F. Muñoz, Synthesis and characterisation of SnO-containing phosphorous oxynitride glasses, *J. Non-Cryst. Solids*, 354 (2008) 1822-1827.
18. F. Muñoz, L. Pascual, A. Durán, L. Montagne and L. Delevoye, Structure-Properties relationships in phase separated borosilicate glasses containing P_2O_5 , *European Journal of Glass Science and Technology Part B: Phys. Chem. Glasses*, 48 (4) (2007) 296-301.
17. F. Muñoz, O. Pritula, J. Sedláček and C. Rüssel, The effect of the hydrostatic pressure on the drawing process of phosphate fibres, *European Journal of Glass Science and Technology Part A: Glass Technology* 47(4) (2006) 97-102.
16. F. Muñoz, L. Pascual, A. Durán, R. Berjoan and R. Marchand, Validation of the mechanism of nitrogen/oxygen substitution in Li-Na-Pb-P-O-N oxynitride phosphate glasses, *J. Non-Cryst. Solids* 352 (2006) 3947-3951.
15. François Cheviré, Francisco Muñoz, Charles F. Baker, Franck Tessier, Olivier Larcher, Souhir Boujday, Christophe Colbeau-Justin, Roger Marchand, UV absorption properties of ceria-modified compositions within the fluorite-type solid solution $\text{CeO}_2 - \text{Y}_6\text{WO}_{12}$, *J. Solid State Chemistry* 179 (2006) 3184-3190.

14. F. Muñoz, L. Delevoye, A. Durán, L. Pascual, S. Crystol, J.-F. Paul and L. Montagne, Phosphate speciation in sodium borosilicate glasses studied by Nuclear Magnetic Resonance, *J. Non-Cryst. Solids* 352 (2006) 2958-2968.
13. F. Muñoz, R. Keding, Christian Rüssel, R. Marchand, A. Durán and L. Pascual, Conductivity of phosphate and oxynitride phosphate glasses in the system $\text{Li}_2\text{O-Na}_2\text{O-PbO-P}_2\text{O}_5$, *European Journal of Glass Science and Technology Part B: Phys. Chem. Glasses* 47 (1) (2006) 58-63.
12. F. Muñoz, L. Pascual, A. Durán, J. Rocherullé and R. Marchand, Oxidation behaviour of oxynitride phosphate glasses Li-Na-Pb-P-O-N, *J. Eur. Ceram. Soc.* 26 (2006) 1455-1461.
11. F. Muñoz, L. Pascual, A. Durán and R. Marchand, Compositional and viscosity influence on the nitrogen/oxygen substitution reactions in phosphate melts, *Phys. Chem. Glasses* 46 (1) (2005) 39-45.
10. F. Muñoz, L. Pascual, A. Durán, L. Montagne, F. Agulló-Rueda and R. Marchand, Structure and properties of $(25-x/2)\text{Li}_2\text{O} \cdot (25-x/2)\text{Na}_2\text{O} \cdot x\text{PbO} \cdot 50\text{P}_2\text{O}_5$ metaphosphate glasses, *J. Non-Cryst. Solids* 347 (2004) 153-158.
9. F. Muñoz, D. Benne, L. Pascual, J. Rocherullé, R. Marchand, C. Rüssel and A. Durán, Silicon oxynitride glasses produced by ammonolysis from colloidal silica, *J. Non-Cryst. Solids* 345&346 (2004) 647-652.
8. F. Muñoz, L. Pascual, A. Durán, J. Rocherullé and R. Marchand, Structure of oxynitride phosphate glasses in the system Li-Na-Pb-P-O-N, *Silicates Industriels* 69 (5-6) (2004) 105-111.
7. J. Rocherullé, F. Bourdin, R. Marchand, F. Muñoz and A. Durán, The influence of nitrogen on the devitrification behaviour of a LAS glass studied by DTA, *Silicates Industriels* 69 (5-6) (2004) 113-118.
6. F. Muñoz, A. Durán, R. Marchand and L. Pascual, Corrosion behaviour of alkali-lead oxynitride metaphosphate glasses in acidic medium, *Phys. Chem. Glasses* 44(6) (2003) 416-421.
5. F. Muñoz, L. Pascual, A. Durán, L. Montagne, R. Berjoan, G. Palavit and R. Marchand, Structural study of phosphorus oxynitride glasses LiNaPbPON by nuclear magnetic resonance and X-ray photoelectron spectroscopy, *J. Non-Cryst. Solids* 324 (2003) 142-149.
4. A. Durán, F. Muñoz, L. Pascual and R. Marchand, Structure properties relationships in nitrated phosphate glasses, Proc. of the VII Otto-Schott Colloquium, *Glass Sci. Technol.* 75C (2002) 227-232.
3. F. Muñoz, L. Pascual, A. Durán, J. Rocherullé and R. Marchand, Alkali and alkali-lead oxynitride phosphate glasses: a comparative structural study by NMR and XPS, *C. R. Chimie* 5 (2002) 731-738.
2. F. Muñoz, L. Pascual, A. Durán and R. Marchand, Synthesis and properties of nitrated phosphate glasses in the system $\text{R}_2\text{O-R}'_2\text{O-PbO-P}_2\text{O}_5$ (R,R'=Li,Na), *Phys. Chem. Glasses* 43C (2002) 113-118.
1. F. Moscardó, F. Muñoz-Fraile, A. J. Pérez-Jiménez, J. M. Pérez-Jordá and E. San-Fabián, Improvement of multiconfigurational wave-functions and energies by correlation energy functionals, *J. Phys. Chem. A* 102 (1998) 10900-10902.

Contributions in conference proceedings and peer-review non-SCI journal publications

5. P. Hockicko, P. Bury, L. Muñoz-Senovilla, F. Muñoz, Investigation of acoustic and electrical properties of a LiPO_3 metaphosphate glass, *Communications* 1 (2014) 45-47.
4. P. Hockicko, P. Bury, F. Muñoz, Analysis of dielectric properties of lithium phosphate glasses, *Komunikacie* 15 (2A) (2013) 33-39.

3. P. Hockicko, P. Bury, F. Muñoz, Electrical and dielectric properties of LiPON glasses, *Proceedings of 9th International Conference, ELEKTRO 2012*, art. no. 6225672, pp. 488-492.
2. P. Hockicko, F. Muñoz, P. Bury, P. Sidor, Analysis of acoustic attenuation spectra of LiPON glasses, *Komunikacie*, 12 (2) (2010) 38-42.
1. F. Muñoz, L. Pascual, A. Durán, L. Montagne, R. Berjoan and R. Marchand, Structure and properties of alkali and alkali-lead oxynitride phosphate glasses, Proc. of the Norbert Kreidl Memorial Conference: Building the Bridges between Glass Science and Glass Technology, *Glastech. Ber. Glass Sci. Technol.* 77C (2004) 419-420.

Conference contributions

1. F. Muñoz, L. Pascual, A. Durán, Nitruración de vidrios de fosfato del sistema $R_2O-R'_2O-PbO-P_2O_5$ (R,R'=Li,Na). **XL Congreso de la Sociedad Española de Cerámica y Vidrio**, Onda (Spain), 2000. Oral.
2. F. Muñoz, A. Durán, L. Pascual, R. Berjoan, E. Biche, D. Pérarnau, R. Marchand, Etude XPS de verres de phosphates $Li_{0.25}Na_{0.25}Pb_{0.25}PO_{3-3x/2}N_x$. **Journées GDR Nomade**, Odeillo (France), 2000. Poster.
3. F. Muñoz, L. Pascual, A. Durán, R. Marchand, Propiedades químicas de vidrios de fosfato nitrurados del sistema $Li_2O-Na_2O-PbO-P_2O_5$. **XLI Congreso de la Sociedad Española de Cerámica y Vidrio**, Benalmádena (Spain), 2001. Oral.
4. F. Muñoz, L. Pascual, A. Durán, L. Montagne, R. Berjoan, R. Marchand, Synthesis, structure and properties of nitrated glasses in the system $R_2O-R'_2O-PbO-P_2O_5$ (R,R'=Li,Na). **XIX International Congress on Glass**, Edinburg (UK), 2001. Oral.
5. F. Muñoz, L. Pascual, A. Durán, R. Keding, R. Marchand, Propiedades eléctricas de vidrios de fosfato nitrurados del sistema $Li_2O-Na_2O-PbO-P_2O_5$. **VII Reunión Nacional de Materiales - XLII Congreso de la Sociedad Española de Cerámica y Vidrio**, Madrid (Spain), 2002. Poster.
6. A. Durán, F. Muñoz, L. Pascual, R. Marchand, Structure-properties relationships in nitrated phosphate glasses. **VII International Otto-Schott Colloquium**, Jena (Germany), 2002. Oral.
7. F. Muñoz, D. Benne, L. Pascual, C. Rüssel, J. Rocherullé, R. Marchand, A. Durán, Silicon oxynitride glasses produced by ammonolysis from colloidal silica. **X International Conference on the Physics of Non-Crystalline Solids**, Parma (Italy), 2003. Oral.
8. J. Rocherullé, F. Bourdin, R. Marchand, F. Muñoz, A. Durán, The influence of nitrogen on the devitrification behavior of a LAS glass studied by DTA. **4th International Symposium on Nitrides**, Mons (Belgium), November 2003. Oral.
9. F. Muñoz, L. Pascual, A. Durán, J. Rocherullé, R. Marchand, Structure of oxynitride phosphate glasses in the system Li-Na-Pb-P-O-N. **4th International Symposium on Nitrides**, Mons (Belgium), November 2003. Oral.
10. F. Muñoz, L. Pascual, A. Durán, L. Montagne, R. Berjoan, R. Marchand, Structural study by NMR and XPS of alkali and alkali-lead oxynitride phosphate glasses. **7th ESG Conference on Glass Science and Technology**, Athens (Greece), 2004. Poster.
11. F. Muñoz, L. Pascual, A. Durán, F. Agulló-Rueda, L. Montagne, G. Palavit, R. Berjoan, R. Marchand, Alkali and alkali-lead oxynitride phosphate glasses: a comparative structural study by Raman, Nuclear Magnetic Resonance and X-ray Photoelectron Spectroscopy. **3^{ème} Rencontre Franco-Espagnole sur la Chimie et la physique de l'Etat Solide**, Montpellier (France), 2004. Poster.
12. J. Rocherullé, N. Hémono, F. Muñoz, Microwave induced solution combustion: a novel method for phosphate glass synthesis. **Chemistry Symposium Rennes-Erlangen 2004**, Erlangen (Germany), 2004. Poster.

13. F. Muñoz, L. Pascual, A. Durán, L. Montagne, R. Berjoan, R. Marchand, Structure and properties of alkali and alkali-lead oxynitride phosphate glasses. **Norbert Kreidl Memorial Conference "Building the bridges between Glass Science and Glass Technology"**, Trencin (Slovak Republic), 2004. Poster.
14. F. Muñoz, L. Delevoye, L. Pascual, A. Durán, L. Montagne, Multinuclear NMR study of phosphoborosilicate glasses. **XIX GERM 2005**, Carry-le-Rouet (France), 2005. Poster.
15. F. Muñoz, L. Delevoye, L. Pascual, A. Durán, L. Montagne, Multinuclear NMR study of phosphoborosilicate glasses. **Annual meeting of the Society of Glass Technology, Glass: Past, Present and Future**, Sheffield (UK), 2005. Poster.
16. F. Muñoz, L. Pascual, A. Durán, L. Delevoye, L. Montagne, Structure-properties relationship in P₂O₅-containing sodium borosilicate glasses. **VIII International Otto-Schott Colloquium**, Jena (Germany), July 2006. Oral.
17. F. Muñoz, L. Pascual, A. Durán, L. Delevoye, L. Montagne, NMR characterization and structure-properties relationship in P₂O₅-containing borosilicate glasses. **Materiaux 2006**, Dijon (France), 2006. Oral.
18. F. Muñoz, L. Pascual, A. Durán, L. Montagne, L. Delevoye, R. Marchand, Phosphorous oxynitride glasses: structure, properties and applications. **XXI International Congress on Glass**, Strasbourg (France), July 2007. Oral.
19. L. Montagne, D. Coillot, L. Delevoye, G. Tricot, F. Muñoz, L. Pascual, A. Durán, Structure and properties of phase-separated borosilicate glasses containing P₂O₅. **XXI International Congress on Glass**, Strasbourg (France), July 2007. Oral.
20. A. de Pablos-Martín, N. Hémono, F. Muñoz, A. Durán, M.J. Pascual, Nanocrystalización en vidrios que contienen LaF₃. **XLVIII Congreso de la Sociedad Española de Cerámica y Vidrio**, Oviedo (Spain), November 2008. Oral.
21. F. Muñoz, L. Pascual, A. Durán, Conductivity of phosphorous oxynitride glasses: search for new solid electrolytes. **European Society Glass Conference 2008**, Trencin (Slovak Republic), 2008. Oral.
22. N. Hémono, F. Muñoz, A. de Pablos-Martín, M.J. Pascual, A. Durán, Nano-crystallization of LaF₃-containing glass-ceramics with photonic applications. **European Society Glass Conference 2008**, Trencin (Slovak Republic), 2008. Oral.
23. L. Montagne, L. Delevoye, G. Tricot, E. Creton, D. coillot, B. Revel, F. Muñoz, M. Goswami, G.P. Kothiyal, Solid-state NMR analysis of some sealing glasses and glass-ceramics. **National Symposium on Science & Technology of Glass and Glass-Ceramics (NSGC-08)**, India, 2008. Oral.
24. A. de Pablos-Martín, N. Hémono, F. Muñoz, A. Durán, M.J. Pascual, Nano-crystallization in LaF₃-containing glasses. **PACRIM8**, Vancouver (Canada), June 2009. Oral.
25. F. Muñoz, A. Durán, L. Montagne, The influence of the structure on the ionic conductivity of phosphate-based glasses. **PACRIM8**, Vancouver (Canada), June 2009. Oral.
26. A. de Pablos-Martín, N. Hémono, F. Muñoz, A. Durán, M.J. Pascual, C. Bocker, R. Wurth, M. Dittmer, S. Gerlach, C. Rüssel, T. Höche, S. Bhattacharyya, I. Avramov, P. Argyrakos, U. Fotheringham, Interphase controlled nucleation and crystallization (INTERCONY). **PACRIM8**, Vancouver (Canada), June 2009. Poster.
27. S. Chenu, J. Rocherullé, P. Bernard-Rocherulle, R. Lebullenger, F. Muñoz, A. Durán, Kinetics and structural aspects of the nitridation of metaphosphate glass compositions. **6th International Conference on Nitrides and related materials**, Karlsruhe (Germany), 2009. Poster.

28. A. de Pablos-Martín, N. Hémono, F. Muñoz, M.J. Pascual, A. Durán, Structural characterization of the nanocrystallisation process in LaF₃ oxyfluoride glasses. **XII International Conference on the Physics of Non-Crystalline Solids**, Foz do Iguacu (Brazil), September 2009. Oral.
29. A. de Pablos-Martín, N. Hémono, F. Muñoz, A. Durán, M.J. Pascual, C. Bocker, R. Wurth, M. Dittmer, S. Gerlach, C. Rüssel, T. Höche, S. Bhattacharyya, I. Avramov, P. Argyrakis, U. Fotheringham, Interphase controlled nucleation and crystallization (INTERCONY). **XII International Conference on the Physics of Non-Crystalline Solids**, Foz do Iguacu (Brazil), September 2009. Poster.
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33. A. de Pablos Martín, F. Muñoz, A. Durán, M.J. Pascual, Vitrocerámicos de oxifluoruro con propiedades fotónicas, **XLIX Congreso de la Sociedad Española de Cerámica y Vidrio**, Linares (Spain), November 2009. Oral.
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35. N. Mascaraque, Q. Riguidel, A. Durán, F. Muñoz, Potenciales aplicaciones de vidrios de fosfato nitrurados. **L Congreso de la Sociedad Española de Cerámica y Vidrio**, Madrid (Spain), November 2010. Oral.
36. N. Mascaraque, A. Durán, F. Muñoz, Phosphorus oxynitride glasses: structure, properties and potential application as solid electrolytes. **19th International Conference on Lithium Batteries**, Montreal (Canada), June 2010. Poster.
37. N. Mascaraque, A. Durán, F. Muñoz, Alternative route to produce high alkali-phosphate glasses through nitridation. **International Congress on Glass 2010**, Salvador (Brazil), September 2010. Oral.
38. N. Mascaraque, A. Durán, F. Muñoz, Phosphorus oxynitride glasses: structure, properties and potential application as solid electrolytes. **International Congress on Glass 2010**, Salvador (Brazil), September 2010. Poster.
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45. L. Muñoz-Senovilla, F. Muñoz, Viscosity behavior of phosphate glasses through their short and intermediate range order structure. **LII Congress of the Spanish Society of Ceramics and Glass**, Burgos (Spain), November 2012. Oral
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47. A. de Pablos, F. Muñoz, A. Duran, M.J. Pascual, Influence of the mixed alkali effect on the nano-crystallisation of LaF₃ containing glasses. **11th European Society of Glass Conference**, Maastricht (NL), June 2012. Oral.
48. M. J. Pascual, A. Durán, F. Muñoz, A. Prange, V. A. C. Haanappel, S. M. Gross, Glass-ceramics in the system MgO-BaO-B₂O₃-SiO₂ under simulated SOFC conditions. **Crystallisation 2012**, Goslar (Germany), September 2012. Oral.
49. P. Hockicko, P. Bury, F. Muñoz, Electrical and dielectric properties of LiPON glasses. **ELEKTRO 2012**, Rajecké Teplice (SK), May 2012. Oral.
50. F. Muñoz, N. Mascaraque, A. Durán, Nitrided phosphate glasses for solid state batteries. **European Materials Research Society Spring meeting**, Strasbourg (France), May 2013. Invited talk.
51. N. Mascaraque, A. Durán, F. Muñoz, I. Seo, S.W. Martin, Processing of thin-film solid electrolytes by RF magnetron sputtering of lithium phosphate glasses. **23rd International Congress on Glass**, Prague (Czech Republic), July 2013.
52. L. Muñoz-Senovilla, F. Muñoz, Viscosity behaviour of phosphate glasses through their short and intermediate range order structure. **23rd International Congress on Glass**, Prague (Czech Republic), July 2013. Oral.
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54. N. Mascaraque, A. Durán, F. Muñoz, Vidrios de fosfato de litio como electrolitos sólidos en baterías de litio. **LIII Congreso de La Sociedad Española de Cerámica y Vidrio**, Alcora, October 2013.
55. F. Muñoz, N. Mascaraque, A. Durán, G. Tricot, L. Montagne, A.C.M. Rodrigues, Structure-properties relationships in lithium oxynitride phosphate glasses. **International Conference on Phosphate Glasses**, Pardubice (CZ), July 2014. Oral.
56. P. Hockicko, P. Bury, L. Muñoz-Senovilla, F. Muñoz, Acoustic attenuation spectroscopy and electrical properties of phosphate and oxynitride phosphate glasses. **International Conference on Phosphate Glasses**, Pardubice (CZ), July 2014. Poster.
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61. L. Muñoz-Senovilla, S. Venkatachalam, G. Tricot, F. Muñoz, L. Van Wüllen, The influence of the structure on the dynamic properties of mixed glass-former $\text{Li}_2\text{O-B}_2\text{O}_3\text{-P}_2\text{O}_5$ glasses. **LIV Congreso anual de la Sociedad Española de Cerámica y Vidrio**, Badajoz, November 2014. Oral.

62. L. Muñoz-Senovilla, F. Muñoz, S. Venkatachalam, L. Van Wüllen, Influencia de la estructura sobre la viscosidad en vidrios de fosfato. **LIV Congreso anual de la Sociedad Española de Cerámica y Vidrio**, Badajoz, November 2014. Oral (Invited).

Participation in organizing scientific committees

International Conference on Phosphate Glasses, Pardubice (CZ), 2-4 July 2014.

10th International Conference ELEKTRO 2014, Rajecké Teplice (SK), 19-20 May 2014.

Thesis advisor

PhD thesis: Laura Muñoz Senovilla
Interrelationship of transport properties in phosphate glasses through their atomic structure
Expected date of dissertation: October, 2015

PhD thesis: Nerea Mascaraque Álvarez
Glassy materials as solid electrolytes for lithium rechargeable batteries
Date of dissertation: September 12, 2014

MSc thesis: Nerea Mascaraque Álvarez, 2009
Synthesis of oxyfluoronitride glasses of the system $\text{Li}_2\text{O-LiF-P}_2\text{O}_5\text{-PON}$

MSc thesis: Laura Muñoz Senovilla, 2011
Rheological properties of phosphate glasses

Supervisor of students projects

Jérémy Coutard
Synthesis of novel oxynitride phosphate glasses for optical applications
University of Rennes 1 (France)
May – September 2013

Ryan Gebhardt
Electrical properties of oxynitride glasses of the systems of composition $\text{Na}_2\text{O-P}_2\text{O}_5$ and $\text{Na}_2\text{O-Al}_2\text{O}_3\text{-P}_2\text{O}_5$
Iowa State University (USA), IMI program for new functionalities in glass
May – July 2012

Marie Delaflotte
Chemical durability of nitrated phosphate glasses
Institute of Technology University of Rennes 1 (France)
April – June 2012

Franck Rojas
Electrical conductivity of oxynitride phosphate glasses in the system $\text{Li}_2\text{O-P}_2\text{O}_5$
Institute of Technology University of Rennes 1 (France)
April – June 2011

Laura Haviez
Structure-conductivity relationship in oxynitride lithium phosphate glasses
ENSICAEN, Caen (France)
June – August 2010

Quentin Riguidel
Synthesis and characterisation of bioresorbable phosphate glasses
Institute of Technology University of Rennes 1 (France)
April – June 2010

Christelle González-Fuente
Synthesis and characterisation of lithium borophosphate glasses
Institute of Technology University of Rennes 1 (France)
April – June 2009

Florian Moreau
Synthesis and properties of high Li₂O-containing phosphate and oxynitride phosphate glasses
Institute of Technology University of Rennes 1 (France)
April – June 2008

Teaching experience

2010/2011 MSc program in Applied Chemistry, University Autonomous of Madrid, Spain
Courses taught: Introduction to glass properties; Chemical properties; Electrical properties

Languages

Spanish: Native
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French: Fluent
Chinese: Basic (Grade 1 HSK)