



M Yolanda Castro Martín

Tenured Scientist (2007-)
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Education

BSc Chemistry, [Universidad de Autónoma de Madrid](#) (1997)
PhD Inorganic Chemistry, [Universidad Autónoma de Madrid](#) (2003)

Former positions

Postdoc CNRS, [Laboratoire Chimie de la Matière Condensée](#), Université Pierre et Marie Curie (France) (2004-6)
JAE Doc-CSIC, [Instituto de Cerámica y Vidrio \(CSIC\)](#) (Spain) (2007)

Research interests

I am a Tenured Scientist of the Institute of Ceramics and Glass (CSIC), since 2008. Her research line is the design, processing and characterization of sol-gel materials, in form of coatings, membranes and/or bulk to multiple applications (optical, mechanical, chemical, thermal, electrical, etc.). This line includes as a priority issue the production of protective, anticorrosive and functional coatings on metal substrates and light alloys, as well as, nano-structured layers with corrosion inhibitors and bioactivation of metal alloys for prostheses. I have extensive knowledge in the preparation of sols and suspensions that incorporate surfactants, for the preparation of nanostructured materials with ordered mesoporosity. The application of this type of materials is very broad, ranging from electrochemical and photocatalytic devices to protective, anticorrosive and functional coatings, on metallic and glass substrates. At the present, i work in the development of protective coatings of light alloys, Al and Mg, for aeronautical, aerospace and biodegradable implants applications, moreover i work in the preparation of transparent glass-ceramics by sol-gel, oxyfluoride doped with rare earths, for photonic applications. In general, the sol-gel process allows producing very sophisticated nanomaterials and to tailor materials for very specific applications can be produced.

Throughout, my scientific career, I have obtained two awards, more than 65 articles in SCI journals, including 3 patents. I have supervised more than 20 students, including master's and final-year students, 1 doctoral thesis and other in progress. I have extensive experience in European and national projects and have participated in more than 50 national and international conferences.

Memberships

Treasurer of the Sociedad Española de Cerámica y Vidrio (SECV). Date: 2016-
<http://www.secv.es/>

Committee Member of TC16 Nanostructures,
http://www.icglass.org/technical_committees/?id=15&committee=TC16: Nanostructures#members

Committee Member of Electrophoretic Deposition International Network,
<http://www.electrophoretic-deposition.com/index.shtml>

General teaching experience

Master's programs: “Materiales Avanzados y Nanotecnologías” de la Universidad Autónoma de Madrid, Department of Physics of Materials and Applied Physics, “Sol-gel Process” Start: 26/10/2011; End: 22/10/2017.

Master's programs: “Ingeniería de Materiales en Universidad Complutense de Madrid” de Escuela Técnica Superior de Ingenieros de Caminos, Canales y Puertos, “Materiales para las Energías Renovables – Sol-Gel Process” Start date: 10/04/2014 End: date: 20/09/2017.

Experience supervising doctoral Thesis

Type of Project: Thesis “Materiales vitrocerámicos transparentes producidos por fusión y por sol-gel”, PhD. Student Giulio Gorni, Date of Reading: 2019.

Type of Project: Thesis “Recubrimientos mesoporosos y mesoestructurados de TiO₂-anatasa por el método sol-gel para aplicaciones en sistemas fotocatalíticos, Student: Noemi Arconada Gómez-Jareño, Date of Reading: 2012.

Industrial and intellectual property

Title registered industrial property: Procedimiento de preparación de películas cerámicas sinterizadas; fotoactivas, película obtenida y sus usos; Inventors/authors/obtainers: Z. Gonzalez; M J. Pérez; L. E. Luece; Ll. San-Miguel; B. Ferrari; Y. Castro; A. J. Sánchez Herencia; C. Mendoza; Entity holder of rights: Hisbalit S.A. ; N° of application: P201530865; Country of inscription: Spain ; Date of register: 18/06/2015.

Title registered industrial property: Glass-like environmentally friendly sol-gel coatings for corrosion protection of metals; Entity holder of rights: CSIC; N° of application: PCT/ES2010/070726; Date of register: 2010.

Title registered industrial property: Recubrimientos vítreos realizados por sol-gel para la protección de metales frente a la corrosión; Inventors/authors/obtainers: C. Rosero; Y.

Castro; M. Aparicio; A. Durán; Entity holder of rights: CSIC; N° of application: P200930982; Date of register: 2009.

Title registered industrial property: Procedimiento de Obtención de Recubrimientos por Deposición; Electroforética (EPD) a partir de Soluciones y Suspensiones Sol-Gel; Inventors/authors/obtainers: B. Ferrari; Y. Castro; R. Moreno; J. Gallardo; A. Durán; Entity holder of rights: CSIC; N° of application: P200002585; Country of inscription: Spain; Date of register: 2000.

Selected R&D projects funded through competitive calls of public or private entities

Name of the Project: Centre for functional and surface-functionalized glasses (FunGLASS)-Phase 2 Project Funded: H2020-WIDESPREAD/0321 Start date: 01/03/2017 End date: 01/03/2024

Name of the Project: Vidrios y vitrocerámicos luminiscentes de alta calidad óptica para aplicaciones fotónicas; Project Funded: MAT2017-87035-C2-1-P; Date: 2018-2020

Name of the Project: Efecto del procesamiento sobre la estructura y propiedades de vidrios y vitrocerámicos con aplicaciones Project Funded: MAT2013-48246-C2-1-P Start date: 01/11/2014 End date: 30/11/2017

Name of the Project: Eco-friendly corrosion protecting coating of aluminium and magnesium alloys; Project Funded: ECO/12/333104/ECOPROT; Start date: 01/11/2013 End date: 31/10/2016

Name of the Project: Desarrollo de un nuevo sistema de eliminación de compuestos tóxicos y corrosivos en aire, generados en depuradoras de aguas residuales; Project Funded: Comunidad de Madrid-S0505/AMB-0406; Start date: 2006 End date: 2009

Name of the Project: Advanced environmentally friendly multifunctional corrosion protection by nanotechnology (MULTIPROTECT); Project Funded: BRITE/EURAM; FP6-2003-NMP-NI-3(011783); Start date: 2005 End date: 2008

Name of the Project: Materiales y recubrimientos vítreos y vitrocerámicos con elevada resistencia a la corrosión; Project Funded: MAT2003-05902-C02-01; Start date: 2003 End date: 2006

Name of the Project: High Performance Protection with Sol-Gel Coatings on Metals and Enamels – Surfprotect; Project Funded: BRITE/EURAM; Programme BE97-5111; Start date: 1998 End date: 2002

Selected publications

Y. Castro, A. Durán, Control of degradation rate of Mg alloys using silica sol-gel coatings for biodegradable implant materials. J. Sol-Gel Sci. Techn. 2018. Available online at: <<https://doi.org/10.1007/s10971-018-4824-6>>.

G Gorni; M.J. Pascual; A. Caballero; J.J. Velazquez; J. Mosa; **Y. Castro**; A. Duran. Crystallization mechanism in sol-gel oxyfluoride glass-ceramics. *J. Non-Cryst. Solids*. 501, 145 – 152, 2018. <https://doi.org/10.1016/j.jnoncrysol.2018.01.031>.

U. Tiringir; A. Duran; **Y. Castro**; I. Milosev. Self-Healing Effect of Hybrid Sol-Gel Coatings Based on GPTMS, TEOS, SiO₂ Nanoparticles and Ce(NO₃)₃ Applied on Aluminum Alloy 7075-T6. *J. Electrochem. Soc.* 165 (5) C213 - C225, 2018. DOI: 10.1149/2.0211805jes.

G. Gorni; R. Baldas; J. Fernández; I. Iparraguirre; J.J. Velazquez; **Y. Castro**; L. Pascual; G. Chen; M. Sundararajan; M. J. Pascual. Oxyfluoride glass-ceramic fibers doped with Nd³⁺: structural and optical characterization. *Cryst. Eng. Comm.* 19, 6620 – 6629, 2017. DOI: 10.1039/c7ce01380a.

D. Nieto; A. I. Gómez-Varela; **Y. Castro**; G. M. O'Connor; M. T. Flores-Arias. Improvement of the optical and morphological properties of microlens arrays fabricated by laser using a sol-gel coating. *Appl. Surf. Sci.* 351, 697 – 703, 2015

J. Mosa; M. Aparicio; A. Duran; **Y. Castro**. Mesostructured HSO₃-functionalized TiO₂-P₂O₅ sol-gel films prepared by evaporation induced self-assembly method with high proton conductivity. *Electrochimica Acta*. 173, 215 – 222, 2015.

A. Marouani; N. Bouaouadja; **Y. Castro**; A. Duran. Repair and Restoration of the Optical Properties of Sandblasted Glasses by Silica-Based Sol-Gel Coatings. *International Journal of Applied Glass Science*. 6 (1), 94 – 102, 2015.

V. Roldan; P. de Oña; **Y. Castro**; A. Duran; R. Grau; C. Lagier; P. Faccendini; N. Pellegrini. Photocatalytic and biocidal activities of novel coating systems of mesoporous and dense TiO₂-anatase containing silver nanoparticles. *Materials Science & Engineering C*. 43, 630 – 640, 2014.

L. Fortes; M. C. Gonçalves; R. Almeida; **Y. Castro**; A. Duran. Nanostructured glass coatings for solar control with photocatalytic properties. *J. Non-Cryst. Solid*. 377, 250 – 253, 2013.

N.C. Rosero-Navarro, M. Curioni, **Y. Castro**, M. Aparicio, G.E. Thompson, A. Durán, Glass-like CexOy sol-gel coatings for corrosion protection of aluminium and magnesium alloys, *Surface & Coatings Technology* 206 (2-3) 257-264, 2011.

N. Arconada, **Y. Castro**, A. Durán, V. Héquet, Photocatalytic oxidation of methyl ethyl ketones over sol-gel mesoporous and meso-structured TiO₂ films obtained by EISA method, *Applied Catalysis B, Environmental* 107 (1-2) 52-58, 2011.

L. Paussa, N. C. Rosero-Navarro, F. Andreatta, **Y. Castro**, A. Duran, M. Aparicio, L. Fedrizzi, Inhibition effect of cerium in hybrid sol-gel films on aluminium alloy AA2024, *Surface and Interface Analysis*, 42, 299-305, 2010.

N. Arconada, **Y. Castro**, A. Durán, Photocatalytic properties of porous TiO₂ - anatase films prepared by sol-gel, *Applied Catalysis A. General* 385 (1-2), 101-107, 2010.

Y. Castro, B. Julian, C. Boissie, B. Viana, D. Grosso, C. Sánchez, Preparation, structural and optical characterization of rare earth doped mesoporous Y₂O₃ thin films by EISA method: *Microporous & Mesoporous Materials* 103 (1-3) 273-279, 2007.

Y. Castro, B. Ferrari, R. Moreno, A. Durán, Corrosion behaviour of silica hybrid coatings produced from basic catalysed particulate sols by dipping and EPD, *Surf. Coat. Tech.*, 191(2-3), 228-235, 2005.

Y. Castro, A. Durán, R. Moreno, B. Ferrari, Thick sol-gel coatings produced by electrophoretic depositions (EPD): *Adv. Material.*, 14, 1505-1508, 2002.