



MARIE SKŁODOWSKA-CURIE INDIVIDUAL FELLOWSHIPS 2018

EXPRESSION OF INTEREST FOR HOSTING MARIE CURIE FELLOWS

HOST INSTITUTION

School of Sciences and Technology | VICARTE - Glass and Ceramic for the Arts

RESEARCH GROUP AND URL

VICARTE – Glass and Ceramic for the Arts
www.vicarte.org

SUPERVISOR (NAME AND E-MAIL)

Andreia Ruivo
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SHORT CV OF THE SUPERVISOR

Andreia Ruivo graduated in chemistry at the Faculty of Sciences of the University of Lisbon (FCUL) in 2005. She started working at the Research Unit VICARTE in 2006 in the synthesis of luminescent glasses and enamels doped with lanthanide oxides and in the development of new techniques for the synthesis of gold and copper ruby glass. This work allowed her to obtain the master degree in chemistry at FCUL “Ruby glass synthesis by reduction of Au⁺ and Cu⁺ and formation of nanoparticles” (2008). From 2009 to 2013 she made her PhD in Sustainable Chemistry, at the Faculty of Sciences and Technology of the NOVA University of Lisbon, working in the synthesis and characterization of innovative luminescent glasses for artistic applications in collaboration with the Photochemistry and Supramolecular Chemistry Research Group (Requimte) and VICARTE. During these years her research was focused in the production of innovative luminescent glasses using lanthanide oxides and using other elements like lead halides and copper. Afterwards she started her research on the development of luminescent borosilicate glasses doped with lanthanides and on developing photochromic and photoluminescent materials in zeolites, within the FCT project, “Development of Luminescent Glasses for Art and Industry Utilizing Ultraviolet LED’s and Solar Energy Capture” and the EU project, “Self-Assembly in Confined Space”, respectively. As main methodologies used were standard synthetic methods, UV-Vis absorption spectroscopy, continuous photochemical irradiation, steady-state and time-resolved spectroscopy, flash-photolysis, dilatometry, X-Ray Fluorescence and different microscopy techniques.

For the last years she have lectured at DCR (FCT-NOVA) and at the international Master of Glass Art and Science (FCT-NOVA/FBAUL).

Currently she is a postdoctoral researcher at VICARTE and her areas of expertise include synthesis and characterization of vitreous materials and photophysics. She is focusing on the development of new vitreous materials, using low-cost elements such as Cu and Mn, which may be useful not only in art, but also for lighting or luminescent solar concentrators for photovoltaic cells. She is starting now to explore new surface colouring techniques to introduce luminescence into the final stage of glass production.

5 SELECTED PUBLICATIONS

- A. Ruivo, S.M. Andrade, M. Ferro, J. Rocha, C.A.T. Laia, F. Pina, “Photoluminescent Nanocrystals in a Multicomponent Aluminoborosilicate Glass”, *J. Phys. Chem. C* 120 (43) (2016) 24925–24931.
- A. Ruivo, V.S.F. Muralha, H. Águas, A. Pires de Matos, C.A.T. Laia, “Time-resolved luminescence studies of Eu³⁺ in soda-lime silicate glasses”, *J. Quant. Spectrosc. Radiat. Transfer.* 134 (2014) 29–38.



- A. Ruivo, S.M. Andrade, J. Rocha, C.A.T. Laia, F. Pina, " Formation of Photoluminescent Lead Bromide Nanoparticles on Aluminoborosilicate Glass", J. Phys. Chem. C 118 (23) (2014) 12436–12442.
- A. Ruivo, M.G. Ventura, M.D.R. Gomes da Silva, C.A.T. Laia, "Synthesis of Gold Nanoparticles in Sol-Gel Glass Porogens Containing [bmim][BF₄] Ionic Liquid", J. Sol-Gel Sci. Technol. 68 (2013) 234–244.
- T. Almeida, A. Ruivo, A. Pires de Matos, R. Oliveira, A. Antunes, "Luminescent Glasses in Art", J. Cult. Herit. 9 (2008) e138-e142.

PROJECT TITLE AND DESCRIPTION

Development of new sustainable materials, creating innovation in art and industry

The Research Unit VICARTE – Vidro e Cerâmica para as Artes (Glass and Ceramic for the Arts, www.vicarte.org) is devoted to the promotion of transdisciplinary research applied to glass and ceramics, focusing on the intersections between art and science, stimulating sharing of knowledge, experiences and methodologies. The mission of VICARTE is to promote excellence in glass and ceramics studies at national and international level. The research at VICARTE connects the present and the past, by studying traditional and historical practices, by developing new materials and by exploring different artistic concepts.

Within the research activities planned we seek for candidates interested in working in the development of new materials for sustainable industrial growth, which contribute to a strategic shift from cost-based manufacturing to more flexible production processes of high added value. Development of new materials will include research to ensure efficient and sustainable scale-up to enable industrial fabrication of products. In particular we will focus on:

- Novel luminescent glasses designed with less expensive raw materials.

Previous research developed with LAQV@REQUIMTE will extend to the production of innovative cost effective luminescent glasses and surface coloring coatings;

- New formulations and innovative strategies for traditional colors

Due to the toxicity of some elements commonly used to color glasses and glazes (Pb, Cd, As), their use is being prohibited. VICARTE will explore ways to obtain the same colors and glass working properties.

SCIENTIFIC AREA(S) WHERE THE PROJECT FITS BEST

Chemistry (CHE)