MARIE SKŁODOWSKA-CURIE INDIVIDUAL FELLOWSHIPS 2020

EXPRESSION OF INTEREST FOR HOSTING MARIE CURIE FELLOWS

HOST INSTITUTION

FCT NOVA | School of Science and Technology
Research Unit: VICARTE

RESEARCH GROUP AND URL

Glass and Ceramics for the Arts
URL: https://vicarte.org/

SUPERVISOR (NAME AND E-MAIL)

Andreia Ruivo
E-mail: a.ruivo@campus.fct.unl.pt

SHORT CV OF THE SUPERVISOR

Andreia Ruivo graduated in Chemistry and obtained the master degree in Chemistry at the Faculty of Sciences of the University of Lisbon (FCUL). In 2013 she received her Ph.D. degree in Sustainable Chemistry with the thesis entitled "Synthesis and characterization of innovative luminescent glasses for artistic applications" in collaboration with the Photochemistry and Supramolecular Chemistry Research Group (Requimte) and Vicarte. Currently Andreia Ruivo is a researcher at the research Unit VICARTE – Glass and Ceramics for the Arts, and she is working on the development of new sustainable glass materials, as luminescent and coloured glasses using inexpensive and non-toxic raw materials, creating innovation in art and industry. As main methodologies used are standard synthetic methods, UV-Vis absorption spectroscopy, steady-state and time-resolved spectroscopy, dilatometry, X-Ray Fluorescence, differential scanning calorimetry and different microscopy techniques.

5 SELECTED PUBLICATIONS

- M. Vilarigues, C. Machado, A. Machado, M. Costa, L.C. Alves, I. Pombo Cardoso and A. Ruivo, "Grisailles: reconstruction and characterization of historical recipes", International Journal of Applied Glass Science (2020). DOI: 10.1111/ijag.15793
- C. A.T. Laia, A. Ruivo (2019) "Photoluminescent Glasses and Their Applications". In Pedras B. (ed.) Fluorescence in Industry. Springer Series on Fluorescence, Springer Nature Switzerland AG, Basel. DOI: 10.1007/4243_2019_12
- Ruivo, E. Coutino-Gonzalez, M. l. M. Santos, W. Baekelant, E. Fron, M. B.J. Roeffaers, F. Pina, J. Hofkens, and C. A.T. Laia "Highly Photoluminescent Sulfide Clusters Confined in Zeolites", Journal of Physical Chemistry C, 122 (2018) 14761-14770. DOI: 10.1021/acs.jpcc.8b01247;
- Ruivo, S. Andrade, M. Ferro, J. Rocha, C. A.T. Laia, F. Pina, "Photoluminescent Nanocrystals in a Multicomponent Aluminoborosilicate Glass", Journal of Physical Chemistry C, 120 (43) (2016) 24925–24931. DOI: 10.1021/acs.jpcc.6b04552;

- A. Ruivo, T. Almeida, F. Quintas, R. Wiley, M. Troeira, N. Paulino, C.AT. Laia, C.A. Queiroz, A. Pires de Matos. “Colours of Luminescent Glasses for Artworks” In 12th International AIC Colour Congress, Proceedings, ed. by L. MacDonald, S. Westland and S. Wuerger (2013) 885-888;

PROJECT TITLE AND SHORT DESCRIPTION

From mud waste to glass: Glass development using a sustainable approach

The advantages of using non-plastic materials, like glass, with high durability, a high degree of recyclability and developed from inexpensive raw materials such as silicates, place glass as an optimal solution to reach a more sustainable future. The glass sector is known for high quality products and technological innovation and covers several products of our daily life as containers, flat glass, utilitarian glass and fiber. However, the glass production processes have environmental issues that have raised major concerns. One is concerning the energy consumption, being imperative to work on their reduction. The other issue is the use of toxic or critical raw materials, i.e materials with both economic importance and supply risk, for glass production.
Several studies have been made on the development of glass-ceramic materials using waste mud, however only few studies are focused on the glass production. This project will focus on the development of different glass compositions using mud waste as raw material, moving for a more environmental and economic sustainable future, with lower-CO_2 manufacture of inexpensive sustainable glasses that can be used by a wide range of end-users (namely glass industries, but also designers, architects and artists). This will be achieved by sourcing glass constituents from mud wastes, obtained from Sewage treatment plants and it will be divided into three tasks i) characterization and treatment of mud waste obtained from sewage treatment plants, ii) development of new formulations for glass production and iii) characterization of the developed new formulations.

SCIENTIFIC AREA WHERE THE PROJECT FITS BEST

CHEMISTRY (CHE) | Glass science