

Proceedings of the 5th GLASSAC International Conference

GLASS SCIENCE in Art and Conservation 2017

An international conference devoted to the applications of science to glass art and the conservation of glass artifacts



FICHA TÉCNICA

Editora: **NOVA.FCT Editorial**
Coleção: **Actas e Proceedings**

Título: **Proceedings of the 5th GLASSAC International Conference**

Editores: **Inês Coutinho, Teresa Palomar, Susana Coentro, Andreia Machado e Márcia Vilarigues**

Autores: **Autores vários**

Capa e arranjo gráfico: **Um Ovo a Cavalo, Lda.**

Impressão e acabamento: **Espaço Gráfico, Lda.**

1^o edição **Mai 2017**

ISBN: **978-989-99528-3-6**

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6 - 9 June 2017

FCT NOVA
Campus de Caparica, Portugal

Organized by

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Department of Conservation and Restoration, FCT NOVA
Faculty of Fine Arts, University of Lisbon
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Acknowledgments



Índice

TECHNICAL ART HISTORY

Tale of two industries: The manufacture of bottle and window glass in England from the 17th to the 20th centuries 9

Cobalt and potassium structure and degradation pathways in painted works of art 11

Renaissance Venetian enamelled glass. An analytical investigation to understand their technology and to distinguish genuine from copied artefacts 14

Overview of glass chemistry and technology in late antique Cyprus 16

The use of glass in medieval pigment making 19

Hispano-Moresque architectural glazes in the context of medieval glass technology 22

Investigating a Byzantine technology: experimental replicas of Ca-phosphate opacified glass 25

Thermal properties of the modernist enamels and stain glasses from the city of Barcelona 26

GLASS IN ARCHITECTURE

The creative process of applying grisaille in stained glass 31

Stained glass iconostasis: fragile 'Munich Glass' in Ukraine 34

New development: mouth blown UV protective window glass 37

Glass as an artistic material on exterior façade in 21st century architecture 41

Architectural glass in the 18th to 20th centuries in Iran 43

The detriments of the contemporary stained glass from Estonia 46

Scottish medieval monastic and ecclesiastical window glass 48

ART

Glass: the medium and the metaphor The crossover approach of the glass museum GlazenHuis 51

Glass sculptures meet public in public spaces 53

Glass foam works created from recyclable glass bottles, conservation vessels and waste glass paints 55

Production and application of ceramic decal technology on vitreous substrate 58

Reflection and illusion in glass art; mastering artist Jin Hongo and his works. 61

The contribution of the science of glass to the artistic expression 63

A glass garden 64

Coloring studio glass by metal oxides 65

'Inside Painting' suggested as a new model for contemporary glass art 66

Red glass revisited – a short review of the work made in Vicarte Laboratories 67

ARCHAEOLOGY AND ARCHAOMETRY

Vidros da terra - Glass from the Earth The contribution of archaeology to the history of Medieval and Early Modern glass in Portugal 70

Origins of stained glass in the great east window of York Minster, UK 72

Analytical investigation of 14th century stained glass windows from Santa Croce Basilica, Florence. Glass types and weathering phenomena 73

Study of Picenes Beads from two Iron Age necropolises	76	Organic Surface Coatings on Medieval stained glass and microbiological investigation	112
Glass recycling in the first millennium AD: a spatial-temporal approach	78	POST-ROMAN GLASS IN THE IBERIAN PENINSULA <i>Vidrio pós-romano na Península Ibérica</i> <i>Vidrio post-romano en la Península Ibérica</i>	
Archaeovitreological analysis by PIXE/PIGE of glass fragments from Miranduolo, Chiusdino, Italy	80	The glass from Recópolis: an analytical approach.	116
Analytical investigation of Renaissance Venetian enamelled glass. Potential and limits of portable X-ray fluorescence.	82	Caracterización y comercialización del vidrio en la periferia de al-Andalus (Ciudad de Vascos, Toledo)	118
Preliminary non invasive study of Roman glasses from Jesolo (Ve), Italy.	85	Chemical characterisation of Islamic glass from Silves' Castle (Portugal)	120
Chemical and textural investigation of the glass tesserae from the baptistery of Tyana (Khemerisar) - Turkey.	86	The al-Andalus Glass Project: Production and Invention in Medieval Iberia	122
CONSERVATION		Aproximacion al contenido de un unguentario andalusí por GC-MS (Albalat, Extremadura, s. XII)	124
Conservation of glass at the Corning Museum of Glass: training and future developments	89	Medieval Glass from Santarém (14 th -15 th centuries)	125
Maintenance and safeguarding of stained glass windows	91	Beber a la Moda: copas, tazas y otros materiales arqueológicos en Mallorca (1500-1700)	126
Thermographic analysis of glasses, enamels and grisailles from stained glass windows	94	Vidros, do século XVI, do Poço-Cisterna de Silves	128
Final results of analysis of a 15 th century stained-glass panel "The Throne of Grace" from the Dominican Monastery in Kraków, Poland	97	Potassium-rich glass in Lisbon in the 18 th century	129
Surface roughness impact on medieval stained glass alteration	100	Vidro e sociedade. A vidraria da estação arqueológica do palácio dos marqueses de Marialva nos sucessivos contextos sociais, laborais e económicos sucessivamente documentados (séc. XVII – início do séc. XIX)	132
Corrosion patterns of a historical glass collection from Greece	103	The vase offered to D. Amélia de Orléans by Émile Loubet	133
Research of a chemical treatment based on zinc salts for ancient glass objects sensitive to atmospheric degradation in museums	106		
Protecting historic window glass in Scotland - a look at planning application approval rates over a 10 year period	109		
19 th century stained-glass windows of two mausoleums from Belém do Pará, Brazil: a characterization study	110		



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TECHNICAL ART HISTORY

Potassium-rich glass in Lisbon in the 18th century

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Field of interest: archaeometry, history of glass, archaeology

Introduction

From two archaeological interventions performed in Lisbon (more precisely at Rua do Arsenal (LRA), where the ruins of the Côte-Real Palace were partially discovered, and at the Roman Theatre Museum (LTR), where the remains of a middle-class house dated to the 18th century were found), a group of twenty-five colourless glass fragments was unearthed. This group of colourless glasses was analysed by μ -PIXE and proved to be of a potassium-rich composition, which relates with the Central European glassmaking tradition. The shapes and decorations of the glass fragments can find parallels with other coeval European archaeological assemblages, as well as with the glass production from the Coina Glass Factory in Portugal.

As far as it is known, until the end of the 17th century glass circulating in Portugal was of a soda-rich composition (Coutinho 2016). This suggests that Portugal followed a Mediterranean glass-making tradition, and that the trading in glass with the North and Central European areas was low or inexistent. The 18th century European glass innovations, related to the development of lead glass and potassium-rich glass, spread very fast all over the Portuguese territory and its use (and production?) quickly became almost exclusive (Pulido Valente et al. 2016; Coutinho 2016).

The information about Portuguese glass production comes in majority from historical documents, and the only excavated furnace was the Coina Royal Glass Factory, active between 1719 and 1747. According to J. Custódio, glass *à la façon de Bohême* was being produced in the Coina Glass Factory during the first half of the 18th century (see figure 1) (Custódio 2002, p.113). Concerning other Portuguese glass productions, in 1768 a contract was made between two German entrepreneurs (João Galo and João Jorge, the original German names unknown to us were adapted to Portuguese in the written documents) and the Salvaterra de Magos glass manufactory, with the intent of making its production closer to that of the Bohemian tradition (Custódio 2002, pp.52, 54).

Keywords: Potassium-rich glass, Early Modern period, Archaeometry

Results and Discussion

Analysing the shapes and decorations of the unearthed objects, fragment LTR0014 (figure 1), belongs to an octagonal flask decorated with polychrome enamels, a feature typical of Central European glass from the 17th to 18th century (see for example: Metropolitan Museum of Art, Accession Number 13.179.70a). Flasks with the same shape and very similar decorations were identified among the objects excavated at the Coina Glass Factory. One flask with this shape and a resembling motif is present in the Soares dos Reis Museum, Porto, attributed to the Marinha Grande Glass Factory (figure 1 b). The difference between the two objects is that the design on fragment LTR0014 is enamelled, while on the flask at the Soares dos Reis Museum was engraved (Custódio 2002, p.244,246). Another flask also attributed to the Coina Glass Factory can be seen in figure 1 a), presenting an enamelled motif of the Portuguese shield.

The faceted drinking glasses represented in figure 1 (fragments LTR0055, LTR0063, LTR0064, LRA0126) often appear among the LTR and LRA archaeological excavations in different sizes. These shapes were identified in the Marinha Grande Glass Factory Catalogue, which proves that these type of beakers were produced in Portugal. These shapes were also identified among the finds from the Cistercian nunnery of Clairefontaine

in Belgium, showing that these models were in fashion and circulating throughout Europe (Hellemans et al. 2014).

The archaeometric study tried to answer the provenance questions. Chart in figure 2 has the representation of literature values for K₂O vs. CaO contents taken from Table X.3 (Coutinho 2016). This comparison with literature is based on limited number of data and for that reason the conclusions drawn are only tentative. The reported values for Bohemian glass have very high contents of CaO apart from one reported group (Group F). This is also true for the values reported for Polish glass from Elblag and Poznan (Hellemans et al., 2014). Fragments LTR0064, LRA0006, and LRA0076 are the only fragments that in terms of potassium and calcium oxides can be related with Polish glass from Elblag and Poznan. The great majority of fragments analysed from the LTR and LRA sets are consistent with the Portuguese production from the Coina Glass Manufactory. These fragments are also consistent with the Belgium CL1.1 group reported in Hellemans et al. (2014). However, in general, the values of titanium, manganese and iron oxides of the samples unearthed in Lisbon are lower comparing with the Belgium CLF reported values.

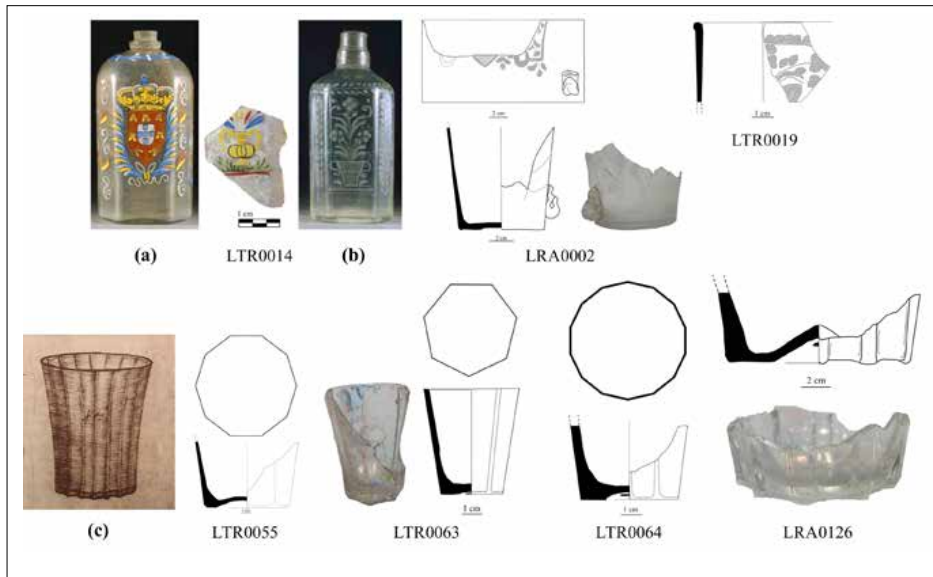


Fig. 1 Examples of fragments unearthed in the two Lisbon archaeological excavations (LTR – Lisboa, Museu do Teatro Romano and, LRA – Lisboa Rua do Arsenal) identified with the respective inventory numbers and examples of objects found in Portuguese museums that were identified as probable Portuguese productions: (a) Polyhedral flask with enamelled decoration, attributed to Coima Glass manufactory, dated ca. 1719-1747. Accession no 342 Cer/MNSR; (b) Polyhedral flask with engraved decoration, attributed to Marinha Grande Glass Factory, dated ca. 1747-1767 (John Beare administration period). Accession no 314 Vid CMP/MNSR; both objects in Museu Nacional Soares dos Reis. (c) Drawing (unknown author) of a drinking glass dated to the mid-18th century and presented in the Catalogue II from Marinha Grande Glass Factory, print XLI.4, in (Barros 1969).

Conclusions

Decorative features allow one to propose that LTR and LRA objects (ribbed beakers, engraved and enamelled vessels), were attempts to imitate glass produced in Central Europe, namely Bohemia. For the majority of these objects, a national production can be considered, and it should be stressed that Central European glassmakers worked in the Coima Glass Manufactory, as well as in the Salvaterra de Magos furnace. With this investigation, it became clearer the need for further studies on the glass that circulated in Portugal in the Early Modern period. These studies will allow one to broaden the knowledge on the trading of glass and glassmakers around Europe.

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Acknowledgements

The authors would like to thank for the support of the Portuguese Science and Technology Foundation (FCT-MCTES), granting SFRH/BD/72552/2010 and to the FCT support through the UID/EAT/00729/2013. L.C. Alves gratefully acknowledges the FCT support through the UID/ Multi/04349/2013 project. The authors would also like to thank the archaeologists Lídia Fernandes (Coordinator at Museu de Lisboa - Teatro Romano, Archaeologist at Lisbon City Hall, Lisboa, Portugal) and António Valongo (private archaeologist) for grant access to the archaeological glass assemblages.

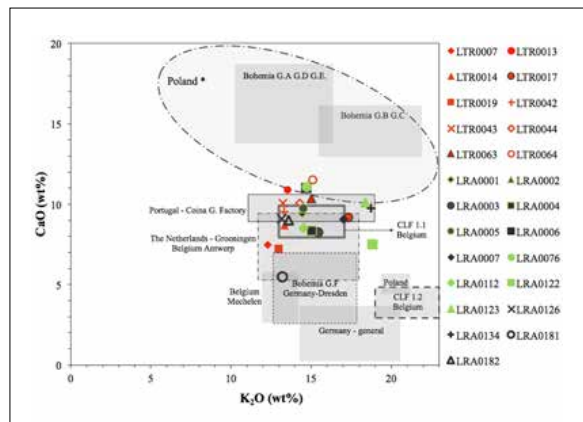


Fig. 2 Binary plot of K_2O vs. CaO concentrations, in weight percent of oxides and determined by means of μ -PIXE and LA-ICP-MS for the potassium rich glass. It is possible to observe mean values (considering the standard deviation) collected from literature and present in Table X.3 (Coutinho 2016), plus the area representing analysed glass found in Poland (Poland*), discussed in Hellemans et al. (2014) and referenced as Kunicki-Goldfinger et al, forthcoming.