

Accepted Manuscript

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PII: S0584-8547(17)30516-5
DOI: [doi:10.1016/j.sab.2018.04.021](https://doi.org/10.1016/j.sab.2018.04.021)
Reference: SAB 5425

To appear in: *Spectrochimica Acta Part B: Atomic Spectroscopy*

Received date: 31 October 2017
Revised date: 30 April 2018
Accepted date: 30 April 2018

Please cite this article as: S. Pessanha, M. Manso, M. Costa, A. Ferreira, R.J.C. Silva, J.M. Sampaio, M.L. Carvalho , Suitability of X ray spectrometry to distinguish a handwritten 16th century real estate sales document from its copy. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Sab(2017), doi:[10.1016/j.sab.2018.04.021](https://doi.org/10.1016/j.sab.2018.04.021)

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Suitability of X Ray Spectrometry to distinguish a handwritten 16th century real estate sales document from its copy

S. Pessanha^{1*}, M. Manso¹, M. Costa¹, A. Ferreira², R.J.C. Silva³, J. M. Sampaio⁴, M. L. Carvalho¹

¹LIBPhys-UNL – Laboratório de Instrumentação, Engenharia Biomédica e Física da Radiação; Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa, 2829-516, Caparica, Portugal

²Arquivo Municipal de Lisboa, Rua B Bairro da Liberdade, Lote 3-6, Piso 0, 1070-050 Lisboa, Portugal

³CENIMAT/I3N, Departamento de Ciência dos Materiais, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, 2829-516 Caparica, Portugal

⁴LIP - Laboratory for Instrumentation and Experimental Particle Physics, Av. Prof. Gama Pinto, n.2 Complexo Interdisciplinar (3is) 1649-003 Lisboa, Portugal

*sofia.pessanha@fct.unl.pt

Abstract

In this work the elemental composition of paper and ink belonging to two paper handwritten documents is compared using non-destructive Energy Dispersive X Ray Fluorescence. The two documents correspond to a real estate sales manuscript dating from 1555 and a more recent copy of the same transaction, of unknown origin. The findings obtained using this spectroscopic technique were confronted with the analysis of two paper samples using Scanning Electron Microscopy coupled to Energy Dispersive system, in order to further evaluate the presence of inclusions. Moreover, fiber identification was also pursued. The raw materials employed presented very similar between documents, however, elemental analysis of paper and ink have proven efficient in distinguishing both paper documents and both inks. The obtained results on the characterization of the materials are consistent with the paleographic analysis and watermark identification previously attempted that dated the copy document from the first half of the 18th century.

1. Introduction

For many centuries, throughout different civilizations, paper was the main material for recording and sharing of cultural, historical and entrepreneurial achievements. Paper is mostly made from cellulose with small amounts of organic and inorganic additives,

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