

# EINLADUNG

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# VORTRAG

von

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Turm 2

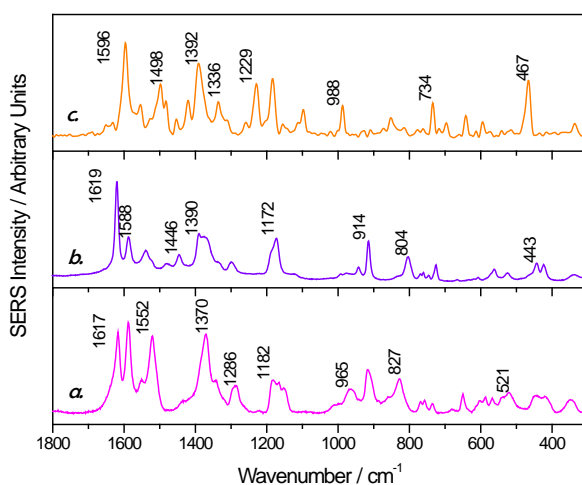
## SERS for the analysis of objects of art and archaeology

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### Abstract

The analysis of dyes in cultural heritage samples is a well-known challenging task, due to their inherent high tinting strength and consequent low concentration in the carrying matrix [1]. This fact severely limits the number of analytical techniques that can be efficiently and micro-destructively employed for their detection and unambiguous identification. Vibrational spectroscopic techniques such as infrared and Raman spectroscopies have been employed with consistent difficulties associated to the sample typology itself and the amount necessary to obtain good quality spectra [2]. The introduction of Surface-Enhanced Raman Spectroscopy (SERS) [3] to the field of conservation science has made the study of such materials possible and more straightforward, both as free molecules [4] and as in artworks [1, 5]. This is possible thanks to SERS ability to yield good signal-to-noise ratio spectra from a very low amount of sample, as well as to the quenching of the fluorescence emission, an additional obstacle when working with traditional Raman spectroscopy. SERS is a very sensitive technique that gives rise to a huge Raman emission due to the giant intensification of the radiation intensity in the presence of metal nanoparticles mediated by the plasmon resonance of selected metals such as Au and Ag [6].



SERS spectra of fibers dyed with BV14 (a), BV3 (b) and AO7 (c).

## REFERENCES

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## CV

In 2001 María Vega Cañamares got her B.S. in Chemistry at the Universidad Complutense de Madrid. She carried out her Ph.D in the Instituto de Estructura de la Materia, CSIC (Spanish National Research Council). In January 2006, she got her Ph.D in Chemistry at the Universidad Complutense de Madrid with the thesis “*Surface Enhanced Raman Spectroscopy (SERS) applied to the study of pigments of interest in Cultural Heritage*”. In 2005 she was awarded an Andrew W. Mellon Conservation Fellowship to work at the Metropolitan Museum of Art of New York, under the supervision of Dr. Marco Leona, head of the Scientific Research Department. In 2007 she worked as a Postdoctoral Research Associate at the City College of New York (CUNY) and the Metropolitan Museum of Art of New York under the supervision of Prof. John R. Lombardi and Dr. Marco Leona, respectively. In 2009 she started working as a Postdoctoral Research Associate at the Instituto de Estructura de la Materia, CSIC. Since July 2012 she holds a scientist position at the same research institute. Her main research interests are the analysis of natural and synthetic dyes by SERS spectroscopy, the fabrication of silver nanoparticles to be used as SERS substrates and the development of SERS sensor for the non-invasive analysis of dyes in artworks. She is author/co-author of ca. 30 scientific papers in international journals (ca. 800 citations, h-index 15), most of them dealing with the SERS analysis of organic dyes of interest in art conservation.