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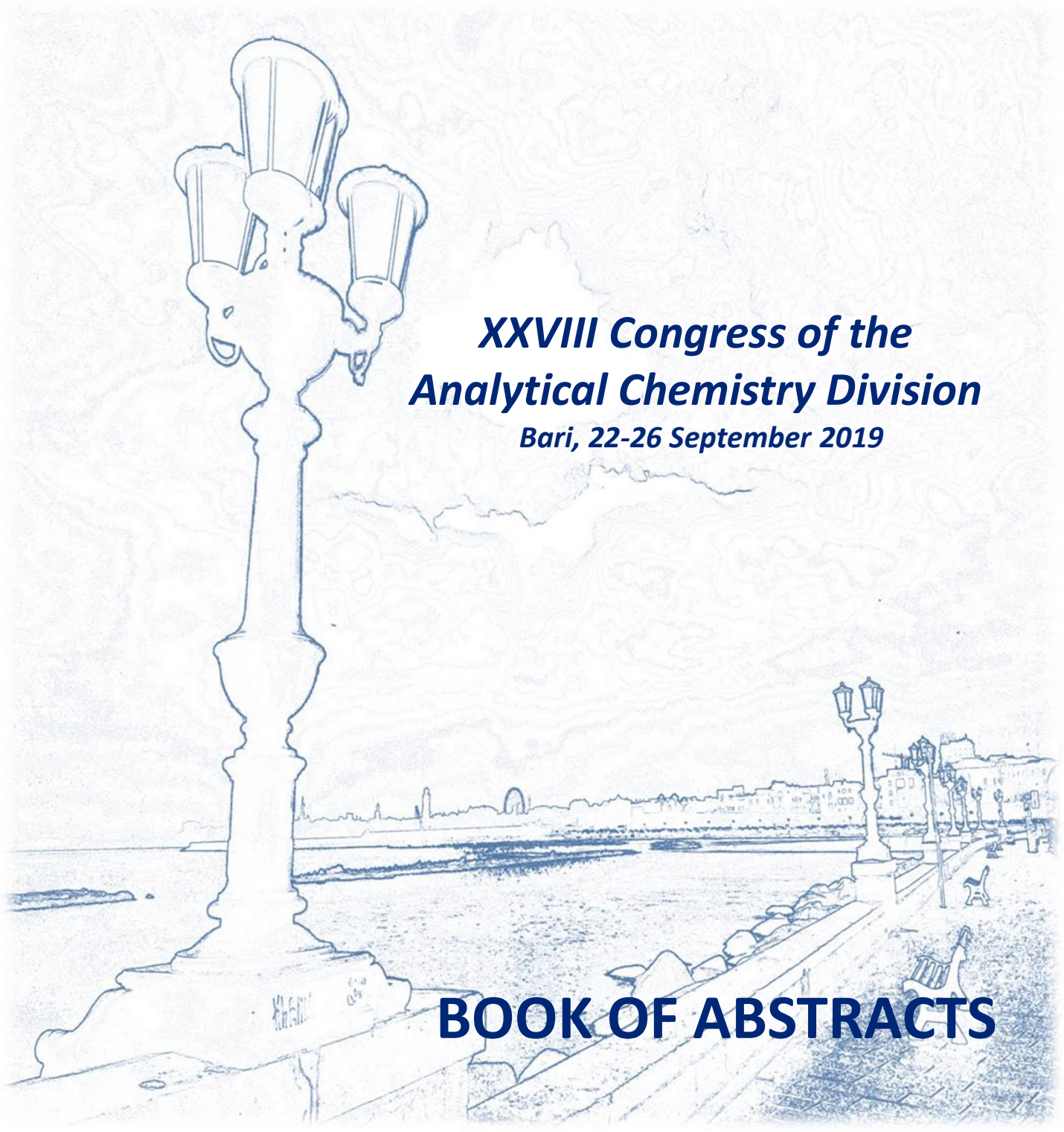

XXVIII Congress of the Analytical Chemistry Division

Bari, 22-26 September 2019

BOOK OF ABSTRACTS

Società Chimica Italiana

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Book of Abstracts

Contents

This ebook contains a collection of the abstracts accepted for presentation at the XXVIII Congress of the Analytical Chemistry Division of the Italian Chemical Society (Bari, 22 – 26 September 2019)

O2 SS4

IMPACT OF HIGH POROSITY SILICA ON ZWITTERIONIC TEICOPLANIN-BASED COLUMNS FOR *ULTRA-HIGH PERFORMANCE CHROMATOGRAPHY*

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The research in the area of enantioselective Ultra High Performance Chromatography (eUHPC) is continuously focused on achieving higher efficiencies and, at the same time, faster analyses. In this work, a novel Chiral Stationary Phase (CSP) was prepared by covalently bonding the teicoplanin selector (TE_A2-2) on Halo 2.7µm 160Å Superficially Porous silica Particles (SPPs) by employing an already known synthetic procedure allowing to obtain a zwitterionic teicoplanin based CSP, which was used to produce the UHPC-FPP-Titan-Tzwitt CSP based on 1.9 µm 120Å Fully Porous monodispersed silica Particles (FPP) and UHPC-SPP-Halo90-Tzwitt CSP 2.0 µm [1-3]. These CSPs were packed into columns (L.: 50 and 100 mm, I.D.: 4.6 mm) and were characterized in terms of permeability, efficiency and thermodynamic under HILIC condition. van Deemter curves were used as main instrument for the kinetic performance evaluation. The UHPC-SPP-Halo160-Tzwitt 2.7 µm showed excellent efficiencies on both achiral (>323,000 theoretical plates/meter, *N*/m; h_r: 1.14) and chiral analytes (>240,000 *N*/m; h_r: 1.53), proving the high potential of this CSP from the kinetic point of view also in comparison to the UHPC-SPP-Halo90-Tzwitt CSP 2.0 µm and UHPC-FPP-Titan120-Tzwitt CSP 1.9 µm. Furthermore, taking into account the thermodynamic viewpoint, on the one hand, the UHPC-SPP-Halo160-Tzwitt 2.7 µm exhibited significantly smaller retention factors (*k'*) in comparison to those observed on the two sub-2µm UHPLC columns (as a consequence of the lower selector loading on the silica). On the other hand, the SPP-Halo 160Å column showed the best resolution power ($Rs/t_{r,2}$) thanks to its enantioselectivity values because of the larger selector density on the silica matrix. In conclusion, in this study we present the potential of the use of high-porosity SPP silica particles in the UHPLC chiral field opening an interesting scenario in this area.

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