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Nota di contenuto	Introduction -- Backgrounds -- Synergistic Effect of the Hybrid of Au Nanoislands on TiO2 Nanowires (Au-TNW) in Laser Desorption and Ionization -- In Situ Surface Reconstruction-Driven Desorption and Ionization Enhancement in Nanoporous Au-modified TiO2 Nanowires Hybrid (npAu-TNW) -- Photothermal Structural Dynamics of Au Nanofurnace-Functionalized ZnO Nanotube (AuNI-ZNT) for In Situ Enhancement in Desorption and Ionization.
Sommario/riassunto	This book presents innovative laser desorption ionization (LDI)-active nanophotonic structures for addressing the challenges that matrix-assisted laser desorption ionization mass spectrometry (MALDI-MS) is currently facing and for enhancing LDI efficiency. It presents a variety of cutting-edge nanophotonic structures to satisfy the mass-analytical needs of sensitivity, reproducibility, and quantification. As opposed to the commercialized, conventional organic matrix used in MALDI-MS, these nanostructures are validated to be highly effective in detecting

small metabolites and drugs, highlighting their considerable potential in the mass spectrometry field. It also systematically elucidates fundamental LDI processes in terms of the photo-thermal, electronic, and structural characteristics of nanophotonic structures, offering mechanistic knowledge of LDI-MS. Even though LDI-MS performance is heavily influenced by a number of nanostructure parameters, relatively little is known about the LDI processes associated with those characteristics. An in-depth understanding of nanostructure characteristics and LDI mechanisms thus paves the way for more effective, rational design and development of nanostructures with improved LDI capabilities. Further, with a focus on multiple cascades in nanostructure functions in response to laser pulse stimuli, this book provides detailed, step-by-step procedures to design and construct a nanophotonic, LDI-active platform, which may serve as a roadmap for graduate students in the field of mass spectrometry. Readers, including graduate students, researchers, and experts working in the related areas of mass spectrometry, nanophotonics, and material science and material engineering, will find a wealth of useful information in this book.

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