

Rapid preparation of large-area densely packed plasmonic hot-spots for reliable sers sensing*

© Jian Chen, Zhenping Huang, Guiqiang Liu[¶]

Jiangxi Key Laboratory of Nanomaterials and Sensors,
School of Physics and Communication Electronics, Jiangxi Normal University,
330022 Nanchang, China

[¶] e-mail: liugq@jxnu.edu.cn; liugq83@163.com

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A facile, efficient and time-saving strategy is proposed to obtain large-area and reliable surface-enhanced Raman scattering (SERS) substrates via artificial heat-treatment of Au nanoparticles or ultrathin Au films sputtered on the silica substrates. Excellent Raman enhancements with the detection limitation down to 10^{-9} mol/L are obtained due to the highly-dense plasmonic hot-spots and strong plasmons near-field coupling. Decreased intensity of Raman peaks with the increased sputtering time of Au nanoparticles or ultrathin films mainly originate from the excited and hybridized coupling of multiple surface plasmons. The simple fabrication strategy and superior performance make these substrates promising candidates for the development of inexpensive and reliable SERS substrates.

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