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*Nanomaterials for Surface Enhanced Spectroscopy:
Is quantitative detection really possible?*

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Otto Maass room 10

A major limitation of nanomaterial-based fundamental studies and applications is surface chemistry (i.e. surface energy). Often, biological and/or chemical recognition elements (antibodies, functional groups, nucleic acids, etc.) are used on the material surfaces. Because surface recognition layers can exhibit variability as a function of temperature, matrix, shelf life, and pH; surface chemistry and quality control measures that promote both nanomaterial stability and responsiveness are vital and motivate our investigations. In this presentation, the synthesis of standard optically-active, solution-phase noble metal nanostructures and their applications using localized surface plasmon resonance (LSPR) spectroscopy and surface enhanced Raman scattering (SERS) will be discussed. Furthermore, implications of quality control measures and perm-selective surface chemistry design will be shown to be important parameters for using these materials in various environmental and health diagnostic applications. In the future, these results could be expanded for different nanomaterials cores, molecular targets, and nanomaterial-based detection platforms. This research is inherently interdisciplinary, and resulting applications could range from those in biology, chemistry, environmental science, forensics, and medicine.

EVERYONE IS WELCOME!
