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Abstract

This feature article focuses on the use of colloid chemistry to engineer metallic nanostructures toward application in surface enhanced Raman scattering (SERS) sensing, in particular for ‘real-life’ applications, where the analyte may be present in complex mixtures. We present a broad summary of the field, including recent advances that have been developed during the past 10 years. Real-life applications require a rational design and we aimed at identifying the key elements involved in it. The discussion is centered around colloidal plasmonic nanoparticles and therefore we start from the library of morphologies that have been reported in the literature. To complete the picture, colloidal self-assembly, surface chemistry and the combination with materials science techniques are highlighted. Considering the progress in the field, SERS may ultimately realize its full potential as an ultrasensitive tool for routine analytical applications.

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Keywords: Surface enhanced Raman scattering; SERS; colloidal synthesis; plasmonics

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