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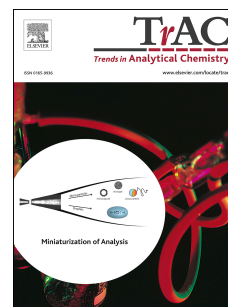
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Copper nanostructures for chemical analysis using surface-enhanced Raman spectroscopy

ACCEPTED MANUSCRIPT

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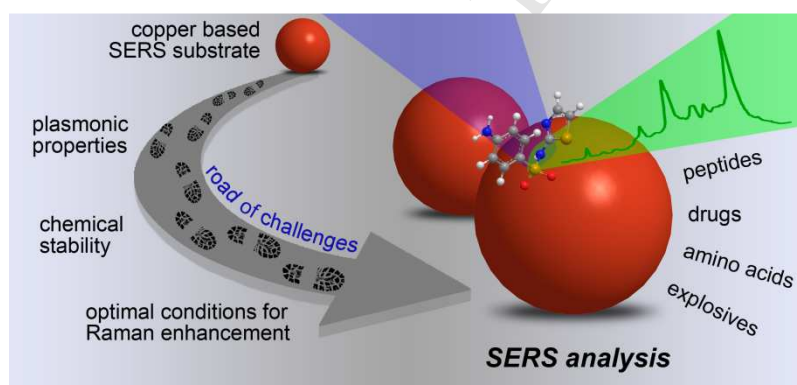
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Abstract

Surface-enhanced Raman spectroscopy (SERS) is a modern tool for chemical analysis. SERS utilizes plasmonic metal nanostructures (SERS substrates) to enhance the molecular specific Raman signal by several orders of magnitude (10^4 – 10^8). SERS substrates based on noble metals (gold and silver) are currently the gold standard due to their unique properties and high chemical stability. However, the application of noble metals significantly restricts widespread implementation of SERS in practice because of their high costs. To overcome this limitation, researchers are developing noble metal-free SERS substrates, and copper-based substrates are a highly promising alternative. The aim of this review is to summarize and critically discuss the available information regarding copper-based SERS substrates (fabrication, Raman enhancement properties, and fields of application) and to estimate their applicability for chemical analysis.

Keywords: copper nanoparticles; copper electrodes; CuNPs; SERS substrates; SERS; enhancement factor

Graphical abstract



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