

Synthesis of Hybrid Microparticle with Multi-functionalities for Sensitive Molecular Detection

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Polydimethylsiloxane(PDMS) has been known for its unique capability of absorbing small molecules and reducing metal ion. Based on these features, we have created facile PDMS microparticle with multi functions of molecular pre-concentration and plasmonic resonance by simple emulsification of PDMS in ionic water. Three-dimensional porous structure of PDMS has allowed the microparticle to be concentrated by charged molecules, increasing the number of surrounding molecules up to 10 times. Metallic nanoparticles within the microparticle are also extensively characterized with dark-field microscopy and scanning electron microscopy. In order to assess the usefulness of our multi-functional microparticle, surface-enhanced Raman spectroscopy(SERS) has been employed.