

Main goal of this work was to develop methodology of immobilization of silver nanoparticles to silanized glass plates and employment of these substrates in biomolecular study using surface-enhanced Raman scattering (SERS). The suitable substrates for SERS spectroscopy, borohydride-reduced colloidal nanoparticles immobilized by mercapto- or aminosilane, have been found. Good SERS spectra of positively charged TMPyP porphyrin as well as of water insoluble TPP porphyrin (without interference of the solvent) have been obtained. Our results clearly show, that our substrates provide unique possibility how to measure SERS spectra of the porphyrins in his native free-base form (what is impossible directly from the colloid). Further experiments confirm that the porphyrins are protected against metalation due to the presence of the silane employed for the silver particles immobilization.