

Importance of metal-adsorbate interactions for the surface-enhanced raman scattering of molecules adsorbed on plasmonic nanoparticles

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The interaction between adsorbates of different nature and plasmonic nanoparticles is reviewed here on the basis of the work done in our laboratory in the past few years. The paper is structured for analyzing the interaction of adsorbates with metal nanoparticles as function of the interacting atom (O, N, or S) and the adsorbate conformation. In the study of the adsorption of molecular species on metals, it is necessary to take into account that different interaction mechanisms are possible, leading to the existence of different molecular forms (isomers or conformers). These forms can be evidenced by changing the excitation wavelength, due to a resonant selection of these wavelengths. Charge-transfer complexes and electrostatic interactions are the usual driving forces involved in the interaction of adsorbates on metal surfaces when these metallic systems are used in wet conditions. The understanding of the metal-adsorbate interaction is crucial in the surface functionalization of meta