

Surface-enhanced Raman scattering and theoretical studies of the C-terminal peptide of the α -subunit human chorionic gonadotropin without linked carbohydrates

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Raman and surface-enhanced Raman scattering (SERS) spectra of the synthetic carboxy terminal peptide of human chorionic gonadotropin α -subunit free of carbohydrate moieties (P37) are reported. The spectral analysis is performed on the basis of our reported Raman spectrum and SERS data of oligopeptides displaying selected amino acids sequences MRKDV, ADEDRDA, and LGRGISL. SERS samples of P37 were prepared by coating the solid peptide with metal colloids on a quartz slide. This treatment makes possible to obtain high spectral batch to batch reproducibility. Amino acids components of P37 display net charges and hydrophobic characteristics, which are related to particular structural aspects of the adsorbate-substrate interaction. The spectroscopic results are supported by quantum chemical calculations performed by using extended Hückel theory method for a model of P37 interacting with an Ag surface. The P37-metal interaction is driven by positively charged fragments of selected amino acids,