Gold Nanoparticles Interacting with ?-Cyclodextrin-Phenylethylamine Inclusion Complex: A Ternary System for Photothermal Drug Release

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 We report the synthesis of a 1:1 ?-cyclodextrin-phenylethylamine (?CD-PhEA) inclusion complex (IC) and the adhesion of gold nanoparticles (AuNPs) onto microcrystals of this complex, which forms a ternary system. The formation of the IC was confirmed by powder X-ray diffraction and NMR analyses (¹H and ROESY). The stability constant of the IC (760 M⁻¹) was determined using the phase solubility method. The adhesion of AuNPs was obtained using the magnetron sputtering technique, and the presence of AuNPs was confirmed using UV-vis spectroscopy (surface plasmon resonance effect), which showed an absorbance at 533 nm. The powder X-ray diffractograms of ?CD-PhEA were similar to those of the crystals decorated with AuNPs. A comparison of the one- and two-dimensional NMR spectra of the IC with and without AuNPs suggests partial displacement of the guest to the outside of the ?CD due to attraction toward AuNPs, a characteristic tropism eff