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Supramolecular complexation between drugs indomethacin, piroxicam and emodin and cucurbit[n]urils on solution and adsorbed on silver nanoparticles

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One of the most important efforts in designing new drug delivery systems is carried out on the need of the drugs arriving to disease tissues like “magic bullets” without interacting with healthy cells, what enhances their effectiveness and avoids secondary effects. Now a day nanomedicine gives hope to achieve these goals. Supramolecular chemistry uses synthetic receptors to form inclusion complexes to transport drugs on their cavities. In this sense cucurbit[n]urils has revealed as a new alternative to cyclodextrins and calixarenes. They have a rigid structure with an internal hydrophobic cavity and two rims whose carbonyl groups allow interactions with cationic ions. In another way cucurbit[n]urils serve as link molecules to functionalize metal nanoparticles surface. Silver nanoparticles have very important optical properties due to the excitation of the localized surface plasmon resonances that have enabled the development of high sensitivity molecular spectroscopies like Surface-Enhanced Raman Scattering (SERS) and Surface-Enhanced Fluorescence (SEF). They can also serve as vehicle to transport drugs, directly or forming complexes with other molecules, which could be included in multi-step drug delivery systems. Here, the characterization of several complexes formed by cucurbit[n]urils and three drugs in solution, as well as adsorbed on colloidal silver nanoparticles is presented. Molecules studied are the non-steroidal and anti-inflammatory drugs piroxicam (PX), indomethacin (IM) and the anti-tumoral emodin (EM). Results show that complexes are not identical and have different properties. Studies will be used in future developments in biotechnology and biomedicine.

Biography

Paz Sevilla has completed her studies in chemistry in the University Complutense of Madrid and Postdoctoral studies from ETH in Zurich. She is Professor at the Physical Chemistry Department of the Pharmacy Faculty of the University Complutense of Madrid. She is the Vice President of the Spectroscopy Committee of the Spanish Society of Optica SEDOPTICA. She has published more than 50 papers in reputed journals.

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