Ellagic acid thin films studied by time-resolved ellipsometry

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Ellagic acid (EA) is a plant-based polyphenol, which has been recently explored for the creation of functional materials [1-3]. In this work, we present the analysis of the transient changes of the optical properties of thin films of EA induced by a pump pulse. By femtosecond pump-probe spectroscopic ellipsometry technique [4-5] we followed photo-induced changes in the dielectric constant of two samples of EA prepared according to Bittrich et al.[6]: 75 nm EA film deposited via thermal evaporation on a substrate of an opaque 80 nm thick gold layer on quartz glass, and a 30 nm EA film deposited on Silicon [(100), native SiOx]

The transient Ψ and Δ spectra, taken at different time delays between the 3.1 eV pump and the probe pulses, were modelled through a uniaxial optical dispersion using an effective medium approximation. Transient effects, caused by the incidence of the pump pulse on the different substrates, were recorded by measuring pump-probe ellipsometry spectra on the substrates alone, and were used for the modelling. Effects on the near-UV range previously assigned to aromatic π−π* transitions [6] were observed.

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