

### Photothermal cantilever deflection spectroscopy of a photosensitive polymer

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The mechanical and chemical information of a poly(methyl methacrylate) (PMMA) film on a microcantilever were simultaneously acquired by photothermal cantilever deflection spectroscopy as a function of ultraviolet (UV) irradiation time. Nanomechanical infrared (IR) spectra from the PMMA-coated microcantilever agreed well with the FTIR spectra of PMMA on gold coated silicon wafer. The decreasing intensities of nanomechanical IR peaks represent chemical as well as mechanical information of UV radiation-induced photodegradation processes in the PMMA which cannot be obtained by a conventional FTIR technique. The observed decrease in the resonance frequency of the microcantilever is related to the change in the Young's modulus of the PMMA under UV exposure.