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Nonlinear Optical Spectroscopy as a Unique Probe for Surfaces of Liquids, Polymers and Solids

Y. RON SHEN, University of California at Berkeley

Second-order nonlinear optical spectroscopy has evolved into a highly surface-specific spectroscopic probe for investigation of surfaces and interfaces. Currently, it is the only technique that can yield surface vibrational or phonon spectra of liquids, polymers, and even solids. Applications of the technique to water, for example, have provided valuable information about structures of various water interfaces not achievable by other means. The same has been found with applications to polymers and crystalline solids. This work was supported by NSF WaterCAMPWS and DOE.