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Non- linear Optical Spectroscopy of Interfaces

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The critical role played by interfaces can be extended to areas such as nanometer size sensors, electronic devices, fuel cells, composite materials, corrosion, lubrication, oil recovery, catalysis, biology, and aqueous environments. The development of superior technologies in these areas can be driven by rapid advances in interfacial science. Second-order nonlinear optical spectroscopy, particularly sum-frequency generation (SFG) spectroscopy, is well suited for advanced characterization of interfaces. It possesses long penetration depths and intrinsic interface specificity. This talk discusses the general principle of SFG spectroscopy as applied in a petrochemical industry with brief examples related to polymer surfaces, aqueous/oxide interfaces and adsorption of molecular additives from liquid onto solid surfaces.