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Committing SINS at the ALS: Broadband Synchrotron Infrared Nano-Spectroscopy

By combining scattering-type-scanning near-field optical microscopy (s-SNOM) with infrared light from a synchrotron source, synchrotron infrared nano-spectroscopy (SINS) enables sensitive molecular and phonon vibrational chemical imaging, spanning the mid- and far-infrared regions (300-5000 cm-1) with <25 nm spatial resolution. This highly powerful combination provides access to a qualitatively new form of nano-chemometric analysis with the investigation of nanoscale, mesoscale, and surface phenomena that were previously impossible to study with IR techniques. We have installed a SINS end-station at Beamline 5.4 at the Advanced Light Source (ALS) at Lawrence Berkeley National Laboratory, making the s-SNOM technique widely available to subject matter experts, such that it can be broadly applied to biological, surface chemistry, materials, or environmental science problems. We discuss recent applications of the SINS technique, highlighting the diverse user science performed at this endstation.

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