ACCESSING SURFACE PLASMONS IN THE INFRARED WITH METAL MICROARRAYS

SHAUN M. WILLIAMS, KENNETH R. RODRIGUEZ, AMANDA D. STAFFORD, SARAH R. BISHOP, USHANI K. LINCOLN, AND JAMES V. COE, *Department of Chemistry, The Ohio State University, 120 W.* 18th *Ave., Columbus OH, 43210-1173*.

Metallic microarrays (of nickel and copper) with hole widths from 1 to $6.5\mu m$ and a hole to hole distance of $12.6\mu m$ show remarkably high transmission in the infrared. This transmission behavior is attributed to interactions of the light with surface plasmons. These surface plasmons can interact with molecules on the surface of the microarrays. This interaction facilitates direct absorption studies of simple molecules as well as self-assembled monolayers on the microarray surface. We will show data where a submonolayer of adsorbed methoxy radicals absorb as much as 90% of the incident radiation at the 1026 cm^{-1} vibration.