THE EXTRAORDINARY TRANSMISSION OF METALLIC ARRAYS OF SUBWAVELENGTH APERTURES FOR THE MOLECULES OF THE CELL MEMBRANE

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Ebbesen's extraordinary transmission effect[a] involves passing more light through apertures in a metal film than is incident upon the holes themselves. We have moved this effect into the infrared region (by using metal arrays with hole widths of about 3 microns and hole-to-hole spacings of about 13 microns) in order to get transmission over the traditional range of molecular vibrations. A method has been developed to record enhanced infrared absorption spectra of self-assembled monolayer and bilayer coatings on metal with 100 to 1000-fold enhancements in absorbance over literature reports. The enhanced infrared absorption spectra of alkanethiolate, phospholipid, and cholesterol assemblies will be presented.

[a] T. W. Ebbesen, H. J. Lezec, H. F. Ghaemi, T. Thio, and P. A. Wolff, *Nature (London)* **391**(6668), 667 (1998).