

Integrating aligned nanorod array onto optical fibers

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Abstract

Surface enhanced Raman spectroscopy (SERS) and surface plasmon resonance (SPR) are two sensitive detection techniques for chemical and biological agent identification. The use of fiber optics can greatly reduce device size while maintaining the sensitivity. Recently, nanostructures, especially metallic nanoparticles, have been incorporated into fiber optical sensors to obtain high sensitivity and specificity. In this talk, we propose to a new way to integrate aligned nanorods onto optical fibers using a modified oblique angle deposition (OAD) technique. By rotating the optical fiber with a proper tilting angle, aligned nanorods from materials such as metals, semiconductors and metal oxides have been successfully deposited. With a slight modification, multi-layer film/nanorod and nanorod/nanorod structures have also been demonstrated. This method has the advantage to coat aligned nanorods on optical fibers at low temperature, and is particularly promising for preparing nanostructured fiber optical probes for sensor applications.