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# Quasi-Ordered Networks of Metal Nanotubes Embedded in Semiconductor Matrices for Photonic Applications

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## Abstract

We report on templated fabrication of metal nanotubes by electrochemical pulsed deposition of Pt in InP and ZnSe porous layers with pore diameters from 40 to 400 nm. Ordered two-dimensional hexagonal arrays of pores are produced in n-InP crystalline substrates, and a uniform distribution of pores is realized in n-ZnSe substrates. We demonstrate the possibility to fabricate arrays of pores and networks of embedded metal nanotubes oriented parallel to the top surface of the template. The optical properties of the produced porous materials are studied using Raman scattering and photoluminescence spectroscopy. The prospects for the elaboration of photonic crystal lenses and beam splitters on the basis of two-dimensional metallo-semiconductor structures prepared on porous templates and tubular structures are demonstrated by means of calculation of their photonic properties.