

Raman and IR-Reflectance Spectra of Porous III–V Semiconductor Structures

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Abstract

Porous layers on the basis of LEC-grown n-type crystals of (111)-GaP and (100)-InP were fabricated by electrochemical etching in aqueous acidic solutions. The prepared samples were studied by micro-Raman analysis and by FTIR reflectance measurements. So-called Fröhlich modes were observed both in Raman and FTIR reflectance spectra for porous substances. Theoretical calculations based on an effective medium theory for the complex dielectric constant were performed. The obtained analytical and experimental data are in a good agreement. The theoretically predicted L–T splitting of the Fröhlich modes was proved experimentally. A coupling between Fröhlich modes and plasmons in conducting samples was observed as well.