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作者: Ogiso, H (Ogiso, Hisato); Nakano, S (Nakano, Shizuka)
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摘要: This study discusses the effect of a MeV ion implantation and Au metal cluster formation into LiNbO3 on the complex dielectric function using a spectrum-fitting analysis. LiNbO3 substrates were implanted with 3.1 MeV Au ions at a fluence of 1 x 10(16) cm(-2), subsequently annealed in air at 800 degrees C for 1 h. Before and after the annealing treatment, the optical spectra were measured in two ranges: from 40 to 700 cm(-1) and from 5000 to 40000 cm(-1). For the spectrum-fitting analysis, the optical models: Brendel model for 40 to 700 cm(-1), and OJL model for 5000 to 40000 cm(-1) were assumed. These models well explained the spectra of the ion-implanted LiNbO3. Consequently the analysis demonstrated the effect of the ion implantation and Au cluster formation on the dielectric function with the phonon polarisation, electric polarisation and surface plasmon resonance, besides the thickness of the ion implanted layer to be 910 nm and the volume fraction of embedded Au clusters in the layer to be 0.73%. 
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地址: [Ogiso, Hisato; Nakano, Shizuka] Natl Inst Adv Ind Sci & Technol, Tsukuba, Ibaraki 3058564, Japan
通讯作者地址: Ogiso, H (通讯作者),Natl Inst Adv Ind Sci & Technol, 1-2-1 Namiki, Tsukuba, Ibaraki 3058564, Japan
电子邮件地址: ogiso.h@aist.go.jp
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