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Bragg light diffraction in nontransparent crystals

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As is well known, in absolutely transparent crystals an acoustooptical interaction is lacking. In this connection's acoustooptical investigations are presented greatest interest in optical range, in which the crystal is not transparent. In order to carry out similar experiments, it is necessary to use the crystal with a small light absorption coefficient at applied wavelength. The main problem is selection of an appropriate buffer crystal that the light beam can penetrate into sample by Bragg angle at required frequency. At present work the acoustooptical properties of Si crystal were investigated at light wavelength 632.8 nm. Dy_2S_3 crystals were used as a buffer sample. It was detected the diffracted light intensity is much more powerful in comparison with that for $LiNbO_3$ crystals. Acoustooptical efficiency M2 (it is defined the acoustic-optical quality of material) has been calculated from the values of optic coefficients and elastic constants for appropriate directions of sound and light. The results of executed investigations have shown the possibility of determination of acoustooptical properties of nontransparent crystals by Bragg diffraction method. At that rate, the very high intensity of diffracted light can be obtained in comparison with that in transparent crystals.