

Color center formation in alkali halides crystal due to N₂ Laser light irradiation

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Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20470896&lokasi=lokal>

Abstrak

ABSTRACT

Many alkali halides crystal develop new absorption bands upon exposure to ionizing radiations. the absorbing centers responsible for these bands are called "Color-Centers". De Boer 1937 was proposed a model for one of the color centers, is called the "F-Center" which consisted essentially of an electron trapped at the position a missing halogen ion (halogen ion vacancy). with the recognition of the highly important influence of structural imperfection or defect (Frenkel and Schottky defects) on the physical properties of alkali crystal it seemed clear that the imperfection were involved in the production and constitutional of the color centers.

in this experiment, the formation and decay of color centers under N₂ laser light ($\lambda = 337,1$ nm) irradiation has been studied on pure KBr crystal in the room temperature using the "Oscilloscopic Method". the F band reach maximum heights in optical density at the end of the radiation pulse. from this experiment were obtained:

the peak position of the F-band at the wavelength 620nm, or the energy $E = 2,00$ eV.

the half-width of the F-band however, was : $W = 0,241$ eV.

Decay time constant = 16,8 , and the concentration of the F center was: $N = 1,6 \times 10^{15}$ per cc.