

Abstract Submitted  
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**Effect of Pressure on Some Optical Properties of  $\text{Ga}_x\text{In}_{1-x}\text{P}$  Semiconductors**<sup>1</sup> P.S. VYAS, V. P. & R. P. T. P. Science College, P.N. GAJJAR, Gujarat University, A.R. JANI, Sardar Patel University — A theoretical procedure is presented for the study of optical properties of ternary alloy  $\text{Ga}_x\text{In}_{1-x}\text{P}$ . The calculations are based on the pseudopotential formalism in which local potential coupled with the virtual crystal approximation (VCA) is applied to evaluate the effect of pressure on the optical properties like refractive index, electronic polarizability, plasmon energy, dielectric constant and equation of state for gallium concentration  $x = 0, 0.25, 0.50, 0.75$  and 1 of the ternary alloy  $\text{Ga}_x\text{In}_{1-x}\text{P}$ . To incorporate the screening effect, local field correction functions due to Hartree, Taylor, Ichimaru et al. and Nagy are employed. The refractive index, electronic polarizability and dielectric constant computed for the parent binary compounds GaP and InP are found to be satisfactorily agreeing with the experimental report. It is seen that the refractive index of  $\text{Ga}_x\text{In}_{1-x}\text{P}$  decreases nonlinearly with the increase in pressure. The results obtained using Hartree's screening functions are not very close to the experimental data as it does not include any exchange and correlation effects. Overall good agreement with the experimental and other theoretical findings confirms the application.

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