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Study of Chalcogenide Glass and their Physical Properties and Applications

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Introduction : Chalcogenide glasses are based on the chalcogen elements S, Se, and Te. These glasses are formed by the addition of other elements such as Ge, As, Sb, Ga, etc. They are low-phonon-energy materials and are generally transparent from the visible up to the infrared. Chalcogenide glasses can be doped by rare- earth elements, such as Er, Nd, Pr, etc., and hence numerous applications of active optical devices have been proposed. Since chalcogenide-glass fibers transmit in the IR, there are numerous potential applications in the civil, medical, and military areas. Passive applications utilize chalcogenide fibers as a light conduit from one location to another point without changing the optical properties, other than those due to scattering, absorption, and reflection.

These glasses are optically highly nonlinear and could therefore be use- ful for all-optical switching (AOS). Chalcogenide glasses are sensitive to the absorption of electromagnetic radiation and show a variety of photoinduced effects as a result of illumination. Various models have been put forward to explain these effects, which can be used to fabricate diffractive, waveguide and fiber structures.

Key Words : Chalcogenide, Glasses, AOS,

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