

Abstract Submitted
for the SES17 Meeting of
The American Physical Society

Kinetics and Possible Mechanism of Photoinduced Optical Effects in Germanium Selenide Thin Films¹ JOSH ALLEN, JONATHAN BUNTON, Austin Peay State Univ, KAREL PALKA, MIROSLAV VLCEK, University of Pardubice, ROMAN GOLOVCHAK, ANDRIY KOVALSKIY, Austin Peay State Univ, UNIVERSITY OF PARDUBICE RESEARCH TEAM TEAM, AUSTIN PEAY STATE UNIVERSITY GLASS TEAM TEAM — Thin films of chalcogenide glasses are attractive materials for various optical applications due to their transparency in IR region, high refractive index and numerous photoinduced optical effects. In order to fully take advantage of these unique properties the mechanisms of light interaction with the glassy matrix and in-situ time dependent behavior of structure and optical properties under irradiation must be further studied. Thermally evaporated films of GeSe₂ were prepared and their photoinduced kinetics were studied as a function of temperature and incident wavelength. It was found that the films underwent both transient and non-transient changes in the optical transmittance. Non-transient changes manifested as photobleaching while transient changes manifested as photodarkening. Furthermore, the changes were found to follow a stretched exponential curve. The quantitative kinetic parameters, tau and beta, as well as the index of refraction, of the photoinduced optical changes have been evaluated and related to the different mechanisms of the photostructural transformations.

¹NSF grant DMR-1409160

Josh Allen
Austin Peay State Univ

Date submitted: 13 Oct 2017

Electronic form version 1.4