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Photostructural changes as a function of photon energy and intensity in thermally deposited As-S thin films[1] JUSTIN OELGOETZ, JOSHUA ALLEN, JONATHAN BUNTON, LAURA NICHOLS, CAITHLEANN THOMAS, ROMAN GOLOVCHAK, ANDRIY KOVALSKIY, Department of Physics and Astronomy, Austin Peay State University, Clarksville, TN, United States, MIROSLAV VLCEK, Faculty of Chemical Technology, University of Pardubice, Pardubice, Czech Republic — Thermally deposited chalcogenide glass thin films (ChGF) can undergo photo-structural changes when exposed to light. The mechanism likely includes processes such as photo-structural relaxation, bond switching and defect formation on both the surface and inside of ChGF. Experimental studies show that light with energies close to the band gap does not modify chemical composition of the surface, but induces simple photopolymerization reactions. UV light with energy above the bandgap significantly increases S/As ratio on the surface by forming a S-rich layer under both environmental conditions. Based on the Density functional calculations presented in this poster, we propose that photovaporization of both oxide and non-oxide cage-like molecules is responsible for the observed effect.

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