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Exploring new UV-Semiconductor alloy system[1] DINESH THAPA, University of Idaho, JESSE HUSO, Washington State University, LEAH BERGMAN, University of Idaho — Semiconductors alloys provide by-designed optical and electronic properties as their bandgap can be tailored via the choice of the alloy composition, x. This research aims at the creation of an alloy system named Mg-Zn-Silicate: $(Mg_xZn_{1-x})_2SiO_4$, that its optical and material properties are hardly known. The $(Mg_xZn_{1-x})_2SiO_4$ has optical properties in the deep-UV region in the range 5 – 7 eV, is environmentally friendly, and with emerging important applications in lighting and wireless communication technologies. In this study, bulk ceramics were synthesized, it was found that the bandgaps shifted deeper to the UV-range as the composition of Mg increased. The preliminary XRD indicated that the diffractions of both samples correspond to the willemite structure. The phonon dynamics of this alloy system as a function of alloy composition will be discussed in terms of lattice and local modes.

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