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Shock-compression on Eu_2O_3 doped pollucite phosphors SHO HAMADA, HIROAKI KISHIMURA, ATSUSHI ARUGA, HITOSHI MATSUMOTO, Natl Defense Academy — Pollucite $CsAlSi_2O_6$ is a natural mineral belong to zeolite group formed with analcime, and general formula is following: $(Cs,Na)_{16}Al_{16}Si_{32}O_{96}\cdot n(H_2O)$. The crystal structure of pure $CsAlSi_2O_6$ is cubic(Ia-3d) and unit cell is 136645 nm Pollucite is stable stone yielding on the surface of the Earth since ancient times and is used to as a raw material of Cs element. Eu_2O_3-doped pollucite phosphors are efficient white phosphor for Application of deep-UV -light emitting diode (LED). Phosphors were prepared by solid-state reaction. 1 mol% Eu_2O_3-doped and 3 mol% Eu_2O_3-doped pollucites were prepared. Shock-recovery experiments were conducted involving the impact of a flyer plate accelerated by a single-stage powder-propellant gun. The recovered samples were characterized by X-ray diffraction (XRD) analysis and photoluminescence (PL) spectroscopy. The XRD and PL results of samples shocked at pressures of 22 GPa indicated that dissolution and amorphous-to-crystalline transformation occurred. In addition, emission peak wavelength of 3 mol% Eu_2O_3-doped sample shift 20 nm(520→500 nm). As a result, it is considered that Eu^{2+} moved in the crystalline by shock-compression.

Sho Hamada
Natl Defense Academy

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