

Abstract Submitted  
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**Fluorescence of Pd-doped Ti:CMAS glass and glass-ceramics**<sup>1</sup> LAURA NICHOLS, Austin Peay State University Student, ROMAN GOLOVCHAK, Austin Peay State University Faculty — Room- and low (liquid nitrogen)-temperature fluorescence is measured for novel Pd-doped Ti-containing calcium magnesium aluminosilicate (Ti:CMAS) glasses and glass-ceramics prepared in air and forming gas atmospheres. A broad fluorescence peak at ~560 nm from F<sup>+</sup> color centers, observed at 77 K in Pd-free and Pd-doped Ti:CMAS parent glasses under the excitation wavelengths of 300-320 nm, suggests the presence of significant concentration of oxygen defects in the vicinity of titanium ions. These defective titanium octahedra (TiO<sub>n</sub>, n<6) are assumed to be found in close proximity in the structure of parent glasses. Glass-ceramics made in forming gas do not show any fluorescence at all, while the samples ceramized in air show blue emission at ~490 nm at the liquid nitrogen temperature under the excitation wavelengths of 260-280 nm. This fluorescence is associated with a UV-excited charge-transfer transition from the 2p orbits of the surrounding oxygen ion to the vacant outer 3d orbit of Ti<sup>4+</sup>, followed by the radiative annihilation.

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