

Supporting Information

Tunable Luminescence in Pr³⁺ Single-Doped Oxyfluoride Glass Ceramic and Fiber

Yongsheng Sun^a, Minbo Wu^a, Shuhang Tian^a, Zhenguo Shi^a, Zhenjie Lun^a, Qingquan Jiang^a,
Yajing Zhao^a, Dongdan Chen^{a,*}, Puxian Xiong^{b,*}, and Zhongmin Yang^a

^aState Key Laboratory of Luminescent Materials and Devices, School of Materials Science and Engineering, South China University of Technology, Guangdong Provincial Key Laboratory of Fiber Laser Materials and Applied Techniques, Guangdong Engineering Technology Research and Development Center of Special Optical Fiber Materials and Devices, Guangzhou 510641, China.

^b School of Physics and Optoelectronics, State Key Laboratory of Luminescent Materials and Devices, Guangdong Provincial Key Laboratory of Fiber Laser Materials and Applied Techniques, Guangdong Engineering Technology Research and Development Center of Special Optical Fiber Materials and Devices, South China University of Technology, Guangzhou 510641, China.

*Corresponding Authors: Dongdan Chen, ddchen@scut.edu.cn

Puxian Xiong, msxiong.puxian@mail.scut.edu.cn

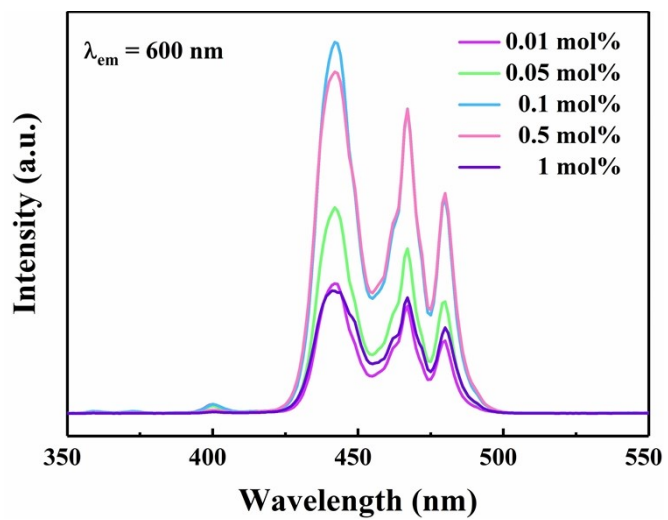


Figure S1. Photoluminescence excitation spectra measured by monitoring 600 nm emission.

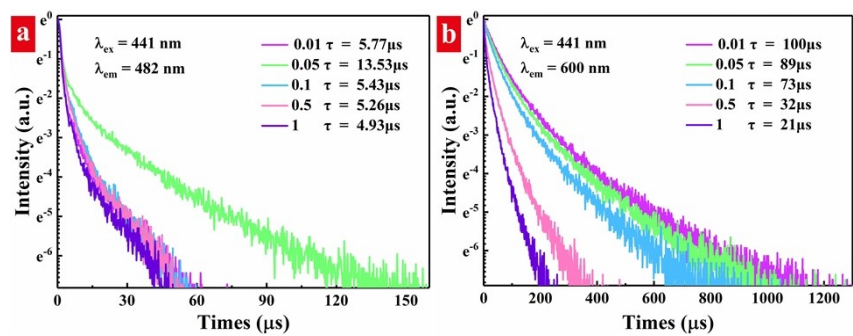


Figure S2. Fluorescence lifetimes at a) 482 nm and b) 600 nm excited at 441 nm of the Pr^{3+} doped PG samples.

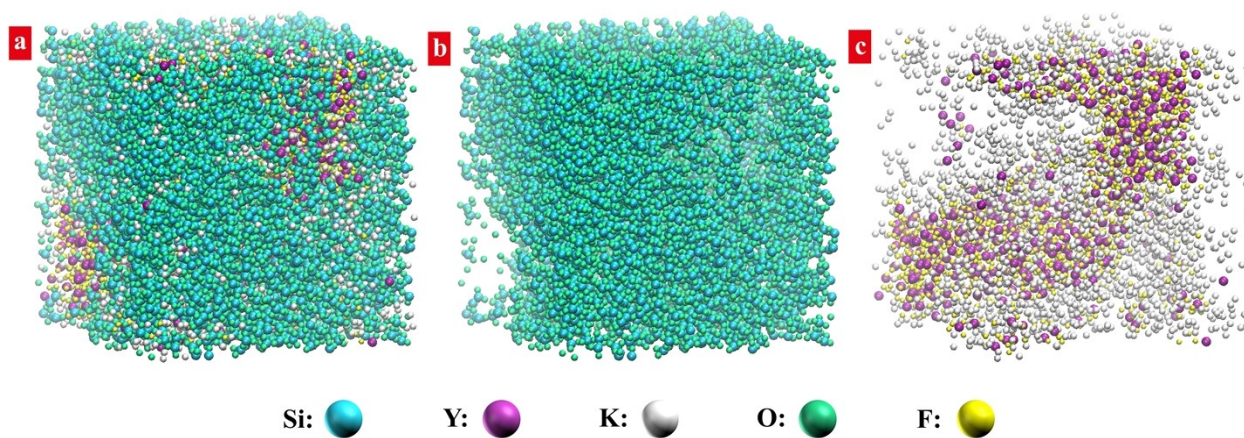


Figure S3. Molecular dynamics (MD) simulations of precursor glass in a 3D view: (a) whole atoms, (b) Si/O distribution, and (c) K/Y/F distribution.

Table S1. Chromaticity coordinates and correlated color temperatures of the Pr³⁺ single-doped GCs at various crystallization temperatures.

	Samples	Chromaticity coordinates		CCT (K)
		<i>x</i>	<i>y</i>	
1	PG	0.5754	0.3707	1768
2	450 °C 2 h	0.5387	0.3694	1767
3	460 °C 2 h	0.5093	0.3618	1843
4	470 °C 2 h	0.4804	0.3609	2048
5	480 °C 2 h	0.4347	0.3488	2533
6	490 °C 2 h	0.4223	0.3477	2751
7	500 °C 2 h	0.3463	0.3251	4853
8	510 °C 2 h	0.3186	0.3224	6222
9	520 °C 2 h	0.286	0.3112	8529

Table S2. Chromaticity coordinates and correlated color temperatures of the Pr³⁺ single-doped glass fiber and GC fibers heat-treated at 520 and 560 °C for 5 h.

	Samples	Chromaticity coordinates		CCT (K)
		<i>x</i>	<i>y</i>	
1	glass fiber	0.5914	0.3781	1782
2	520 °C 5 h	0.4384	0.3367	2338
3	560 °C 5 h	0.3355	0.3294	5353