# Supporting information

## Water Contact Glass@PiG Film Color Converter with Superhigh Brightness and Ultralong Durability for Wide-area Underwater Lighting and Communication

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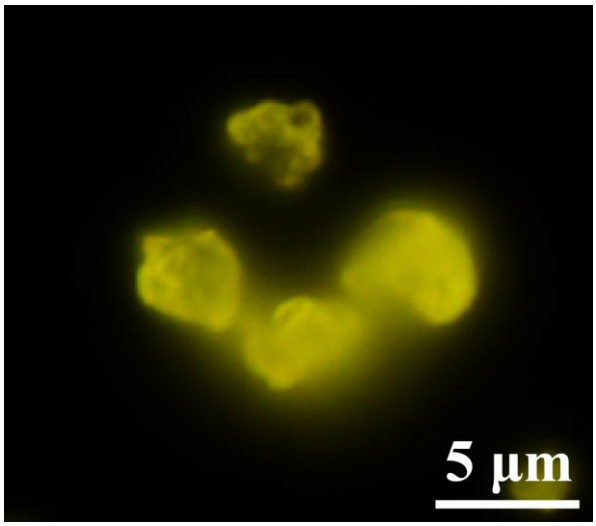


**Figure S1** Fluorescence microscope images of YAG-SiN:Ce phosphor.

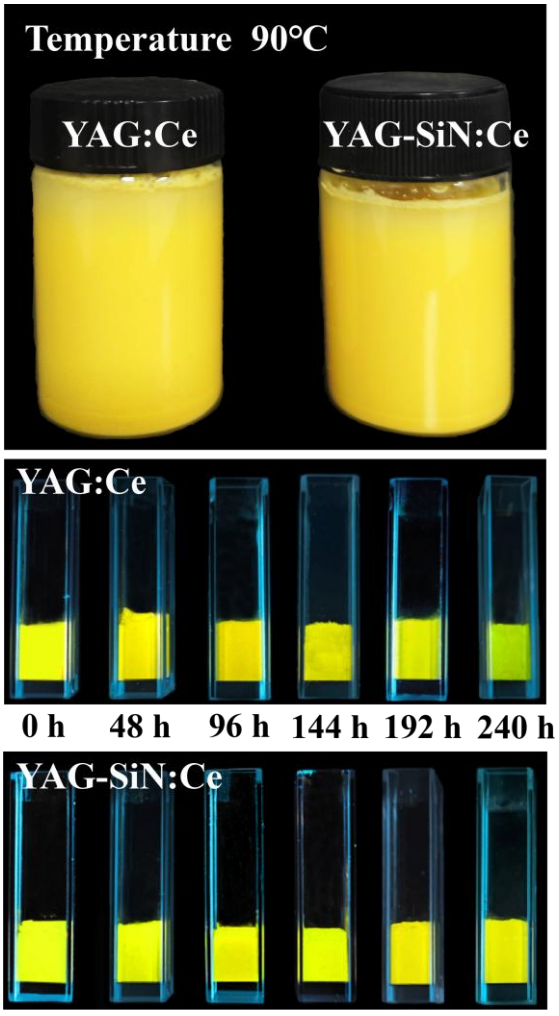


**Figure S2** The color change of YAG:Ce and YAG-SiN:Ce phosphors after submerged in hot water for varying durations.

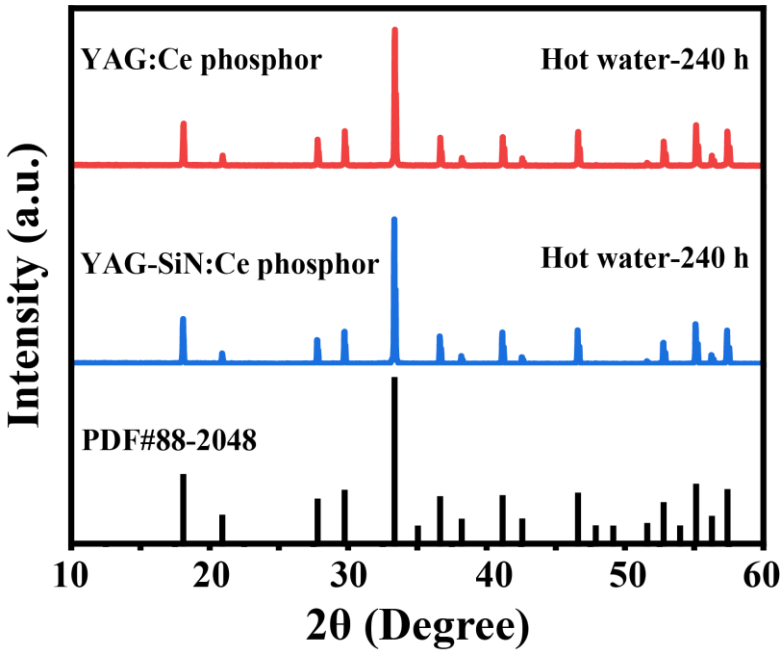


**Figure S3** XRD patterns of YAG:Ce and YAG-SiN:Ce phosphors after hot water treatment.

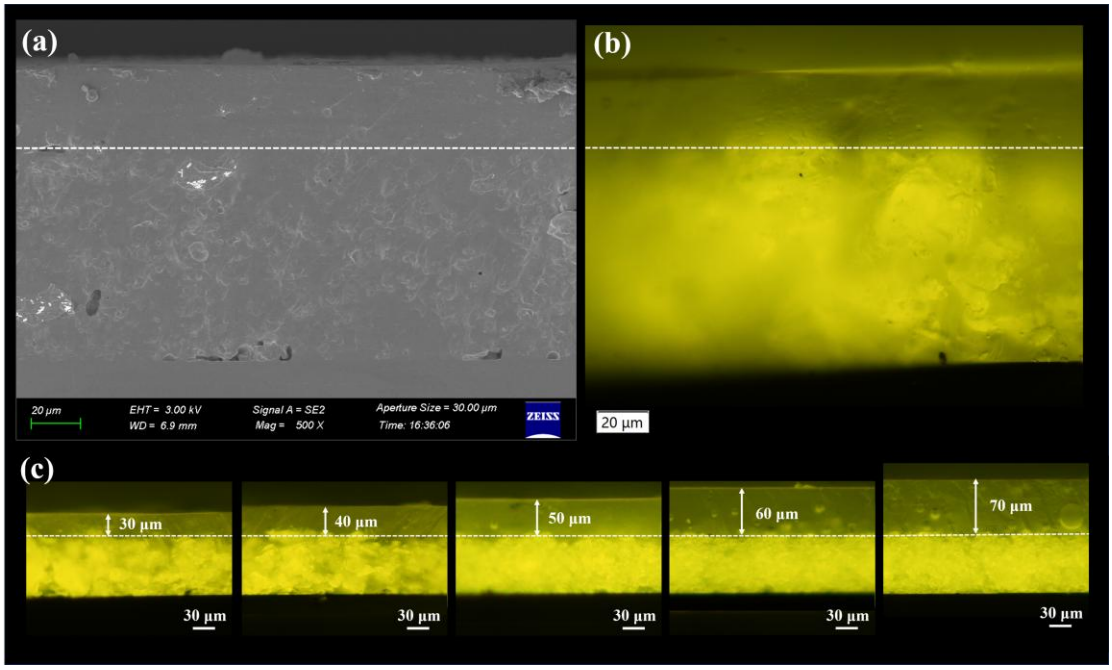


Figure S4 (a) SEM and (b) fluorescence microscope images of Glass@YAG-SiN:Ce PiG film with a glass film thickness of 30 μm; (c) Fluorescence microscope images of Glass@YAG-SiN:Ce PiG films with varying glass film thicknesses

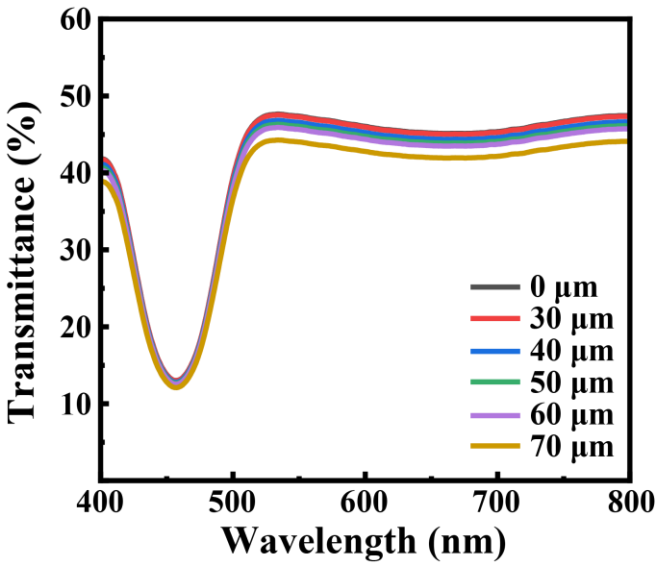


**Figure S5** Total transmittance spectra of Glass@YAG-SiN:Ce PiG films with different glass film thicknesses

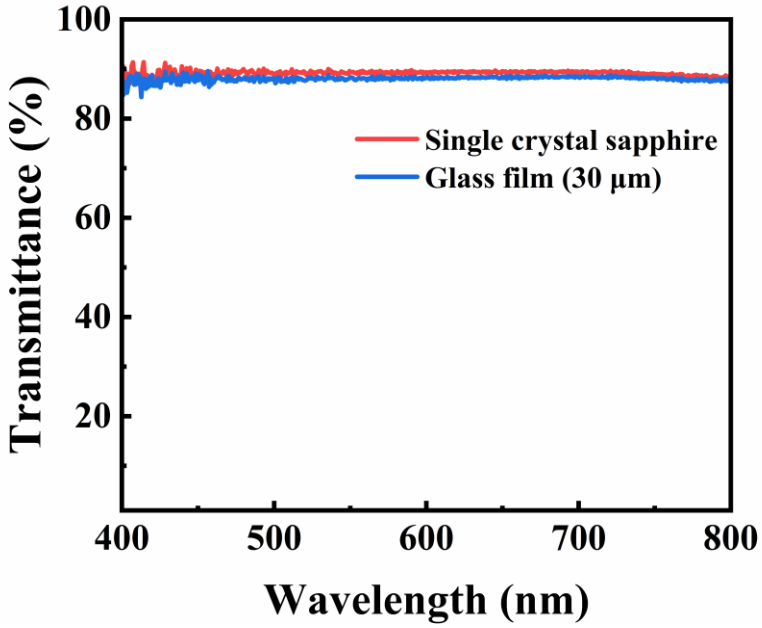


**Figure S6** Total transmittance spectra of single crystal sapphire and glass film.

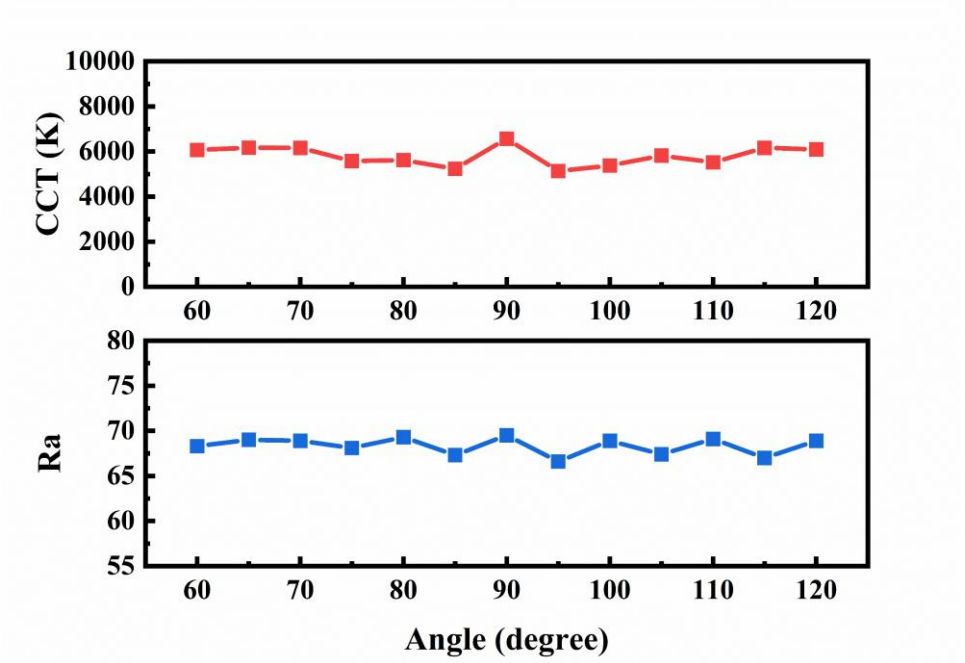


**Figure S7** Ra and CCT values measured at different angles (60 - 120°) of Glass@YAG-SiN:Ce PiG film

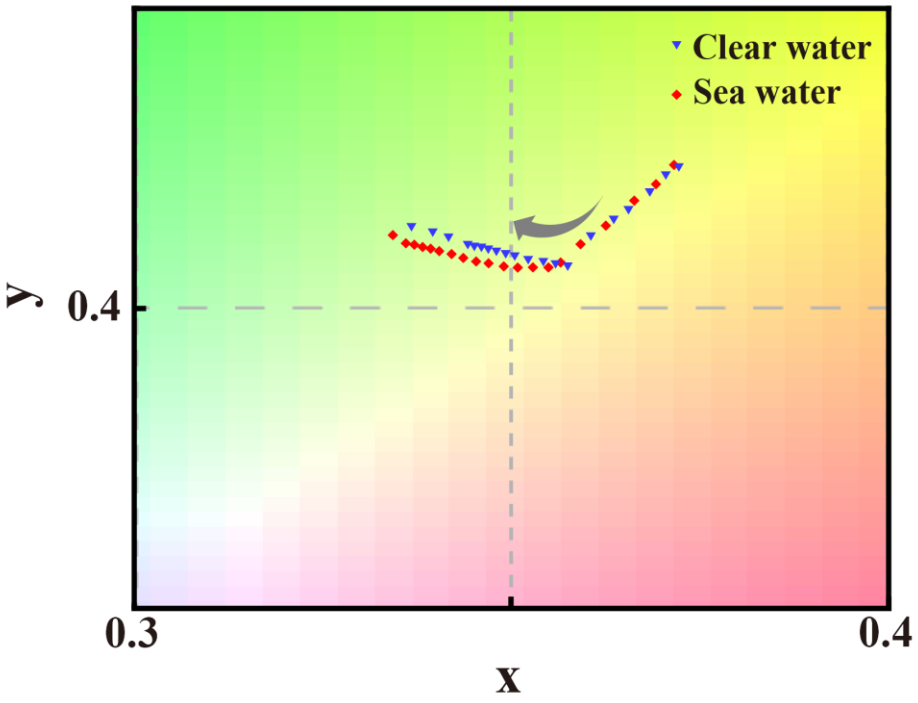


**Figure S8** CIE 1931 color coordinates of light sources at different distances.

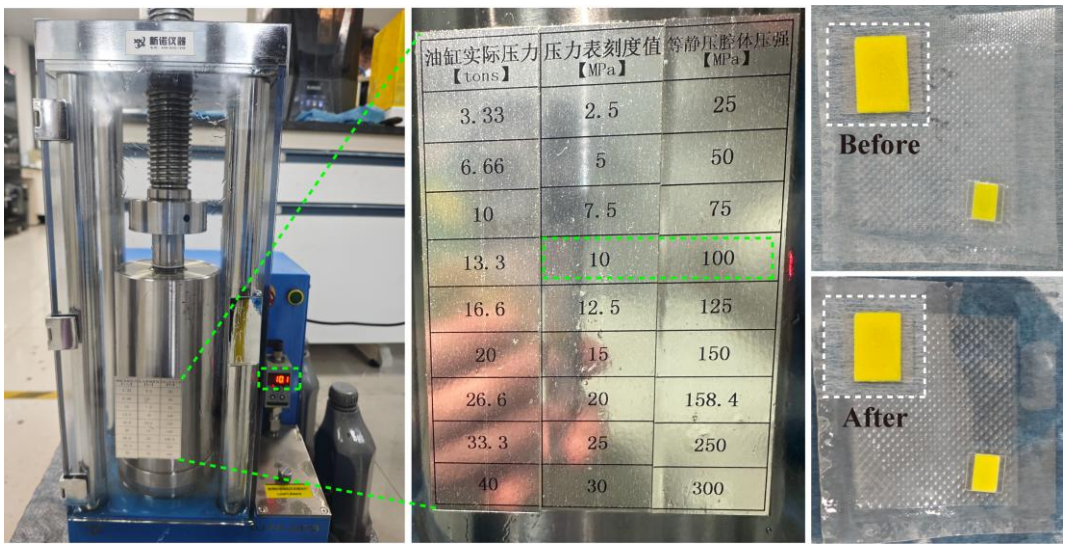


**Figure S9** Glass@PiG film before and after cold isostatic pressure at 100 MPa for 10 minutes.