

Enhanced photochromic performance of Zn doped $W_{18}O_{49}$ - based films for smart windows

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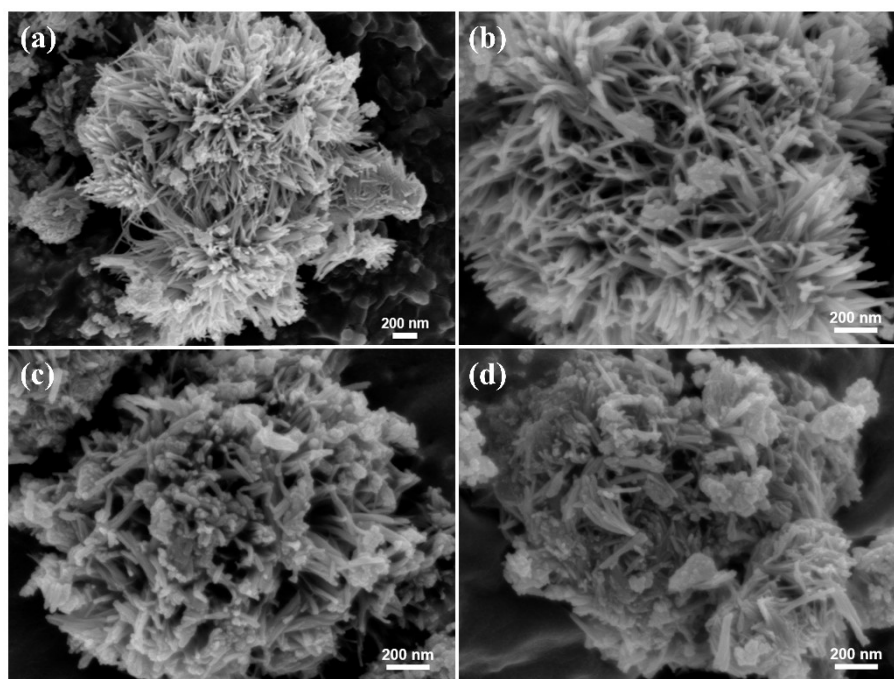


Fig. S1 (a) ~ (d) SEM images of Zn/W-0 ~ Zn/W-0.06 nanopowders, respectively.

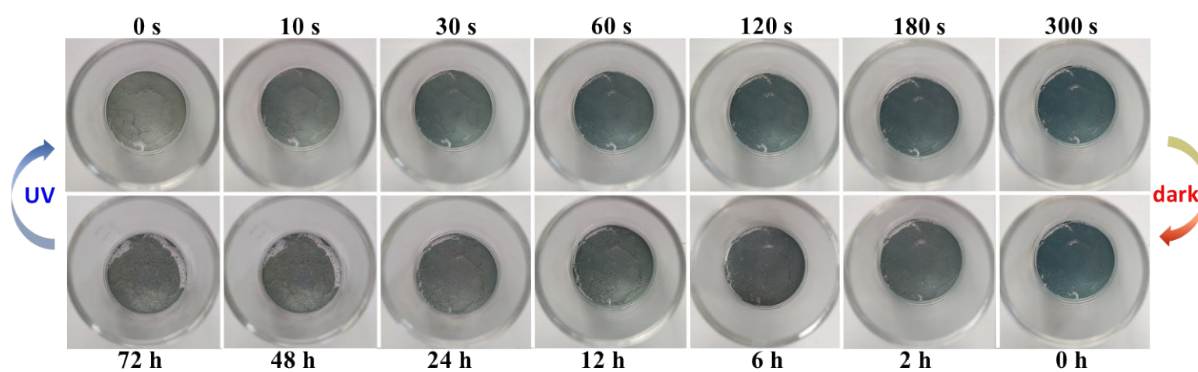


Fig. S2 Coloration of Zn/W-0 nanoparticles and bleaching process in dark at room temperature.

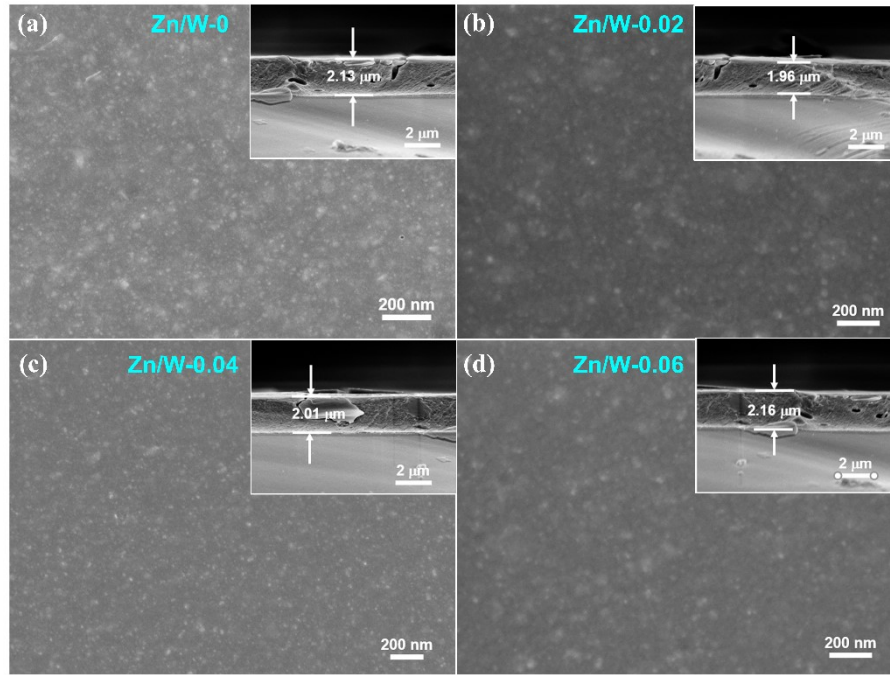


Fig. S3 (a-d) SEM images of Zn/W-0.02~Zn/W-0.06 films, the insets show the thickness of the films.

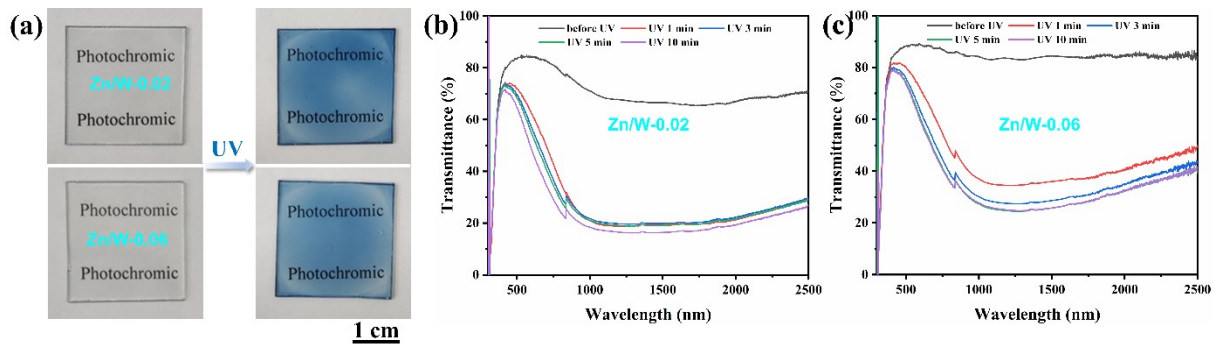


Fig. S4 (a) photochromic photographs, (b-c) transmittance spectra of Zn/W-0.02 and Zn/W-0.06 thin films after UV irradiation for different time.

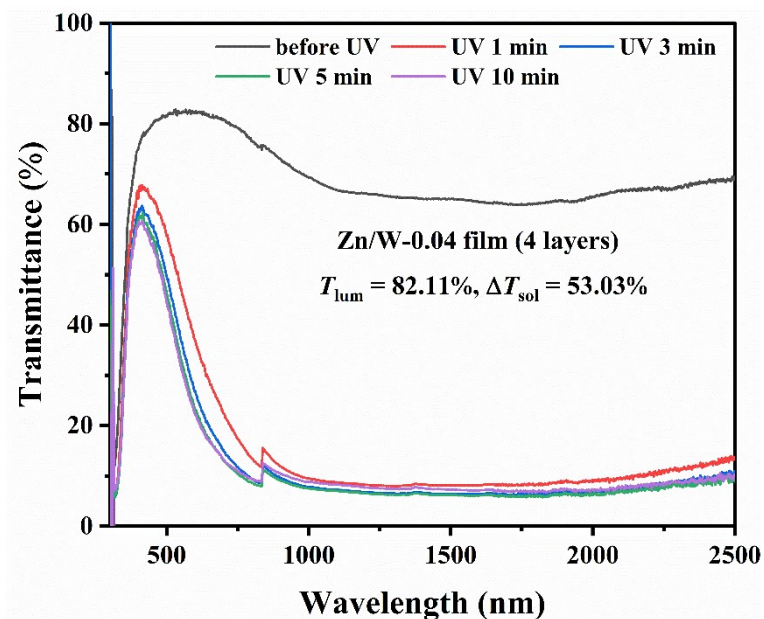


Fig. S5 Transmittance spectra of Zn/W-0.04 films (4 layers) irradiated with UV light for different times

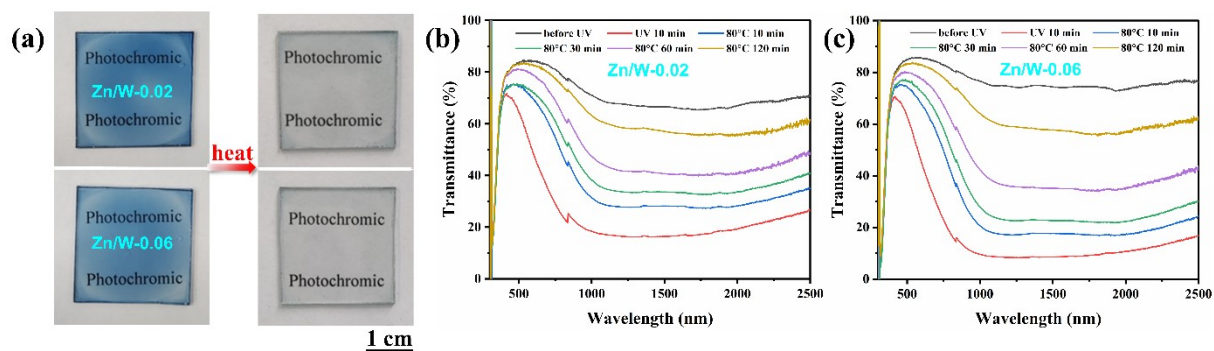


Fig. S6 (a) Faded photographs of Zn/W-0.02 and Zn/W-0.06 films, (b-c) transmittance spectra after in-situ heating at 80°C for different times.