Electronic Supplementary Information (ESI)

Novel Construction Technique, Structure and Photocatalysis of $Y_2O_2CN_2$ Nanofibers and Nanobelts

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Results obtained from other synthetic parameters

If the relative humidity was too high in the experimental process, the electrospun PVP/$Y(NO_3)_3$ composite nanofibers and nanobelts adhere together, as well as the resulting the $Y_2O_2CN_2$ nanofibers and nanobelts. Fig. S1 shows the adhered $Y_2O_2CN_2$ nanofibers whose corresponding composite nanofibers were prepared at the relative humidity of 56 %.

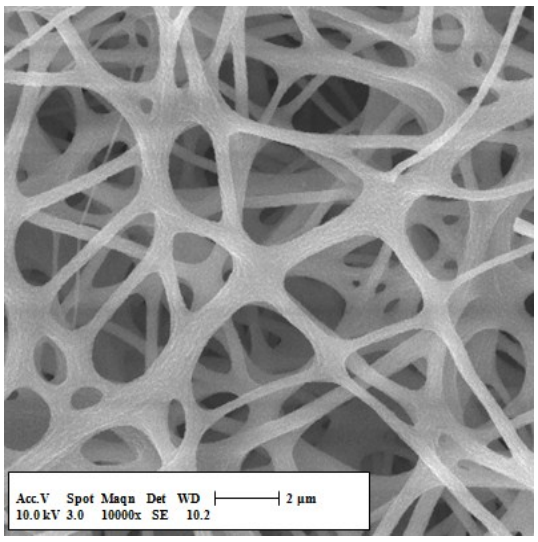

Fig. S1 SEM image of $Y_2O_2CN_2$ nanofibers whose corresponding composite nanofibers were prepared at the relative humidity of 56 %

For the spinning solution, if the mass ratio of yttrium nitrate, DMF and PVP were between 10:79:11 and 10:70:20, the morphology of the electrospun product is

not even. Fig. S2 demonstrates the SEM image of the $Y_2O_2CN_2$ nanomaterials prepared by the mass ratio of 10:77:13.

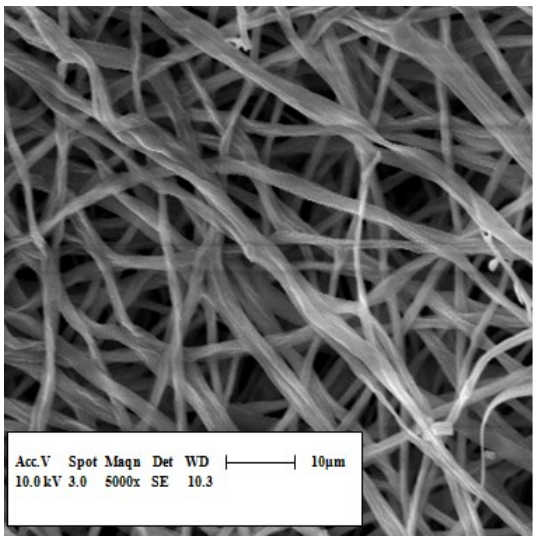

Fig. S2 $Y_2O_2CN_2$ nanomaterials prepared by the mass ratio of 10:77:13 (yttrium nitrate:DMF:PVP, mass ratio)

If the Y_2O_3 nanofibers and nanobelts were cyanamidated in traditional boat-shaped corundum crucibles loaded with some graphite powder under the flowing NH_3 in the same heating process, $Y_2O_2CN_2$ can not be obtained but still Y_2O_3 which is confirmed by XRD patterns of the products, as indicated in Fig. S3.

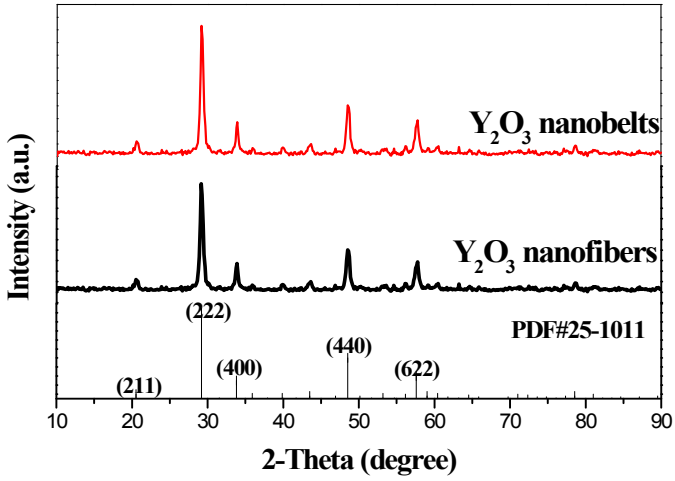

Fig. S3 XRD patterns of the Y_2O_3 nanofibers and nanobelts cyanamidated in traditional boat-shaped corundum crucibles loaded with some graphite powder

Spectrum of the used ultraviolet lamp

Fig. S4 gives the spectrum of the ultraviolet lamp provided by the manufacturer. The main mission wavelength is *ca.* 365 nm, and weak emission is also found down to *ca.* 250 nm.

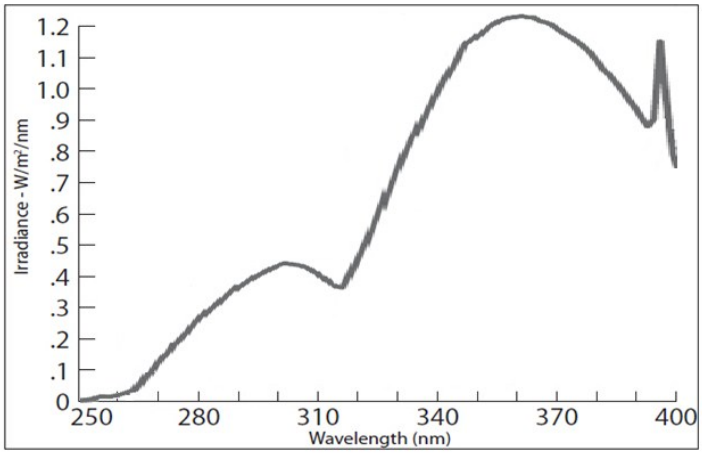

Fig. S4 Spectrum of FHSDI F6T5-365 ultraviolet lamp