Electronic Supplementary Material (ESI) for Catalysis Science & Technology.

Effects of La-doping on Charge Separation Behavior of ZnO:GaN for its Enhanced Photocatalytic Performance

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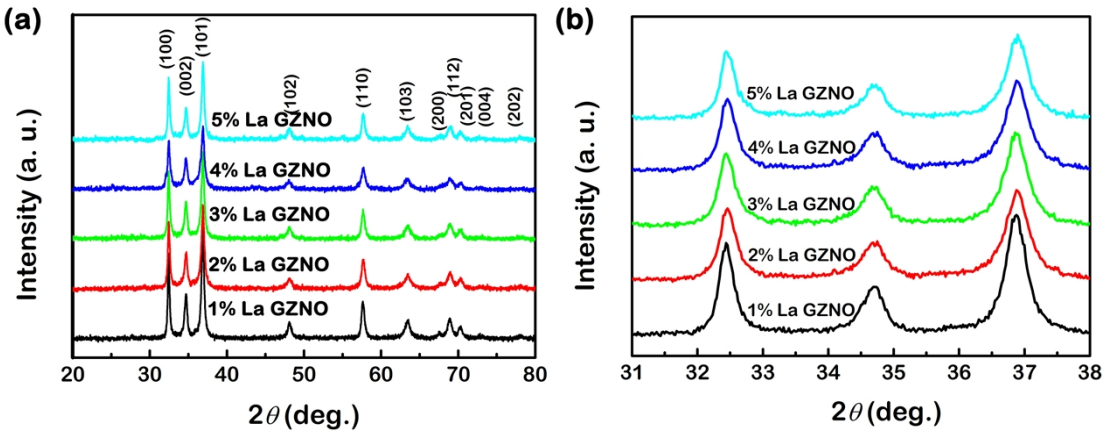

Fig. S1 XRD patterns of 1-5% La GZNO. The peaks tend to be broader and the intensity tends to be lower with the increase of the amount of La_2O_3.

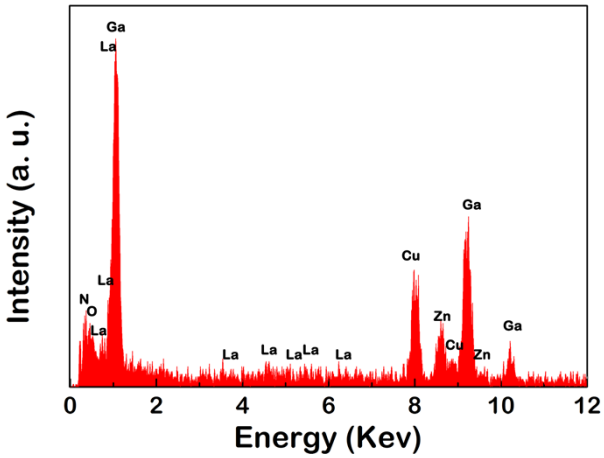

Fig. S2 EDX point analysis for point marked in Fig. 2a.

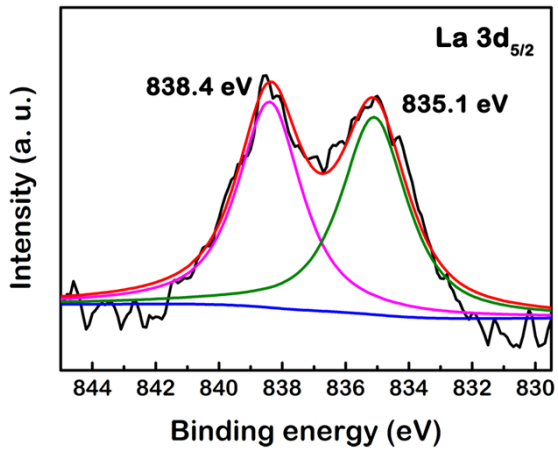

Fig. S3 XPS spectra of La $3d_{5/2}$ of 3% La GZNO. Binding energies of La $3d_{5/2}$ at 835.1 eV and 838.4 eV correspond to La +3 state.[1]

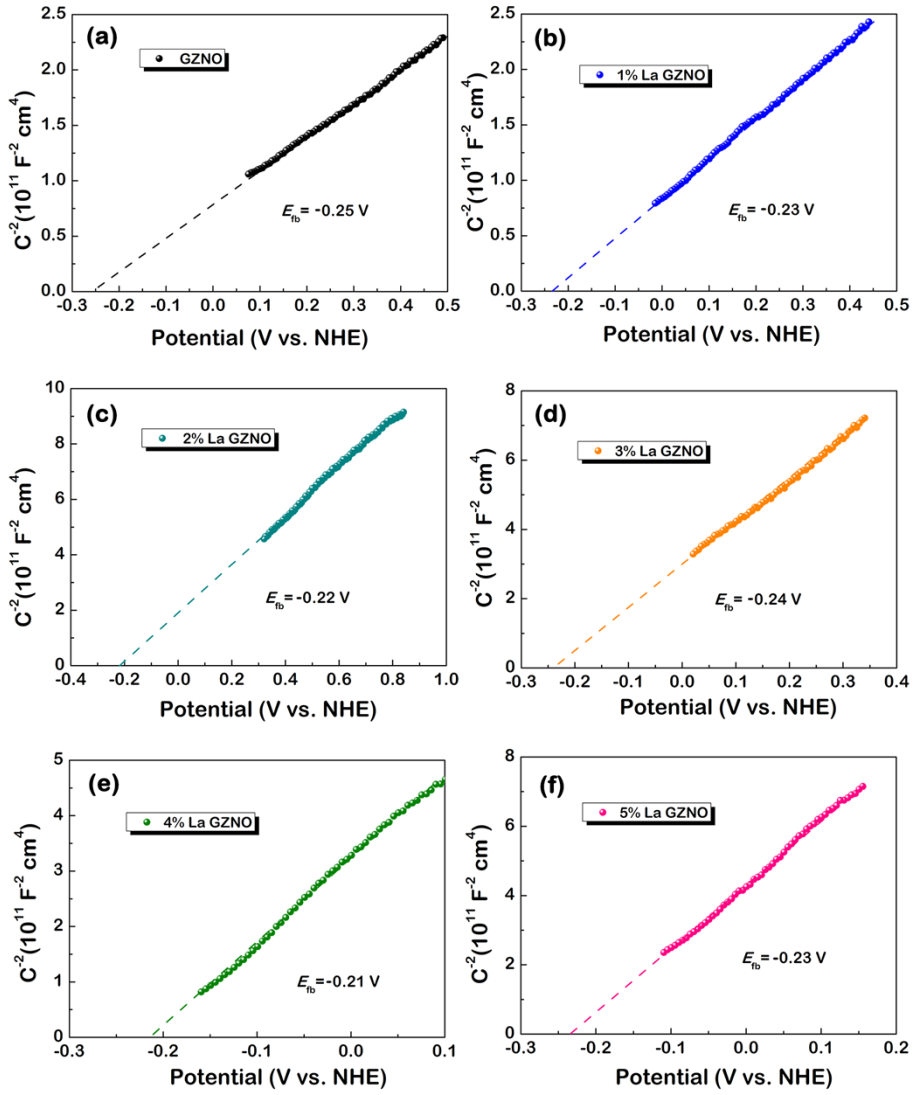

Fig. S4 Mott–Schottky plots of all samples. (a) GZNO, (b) 1% La GZNO, (c) 2% La GZNO, (d) 3% La GZNO, (e) 4% La GZNO, (f) 5% La GZNO.

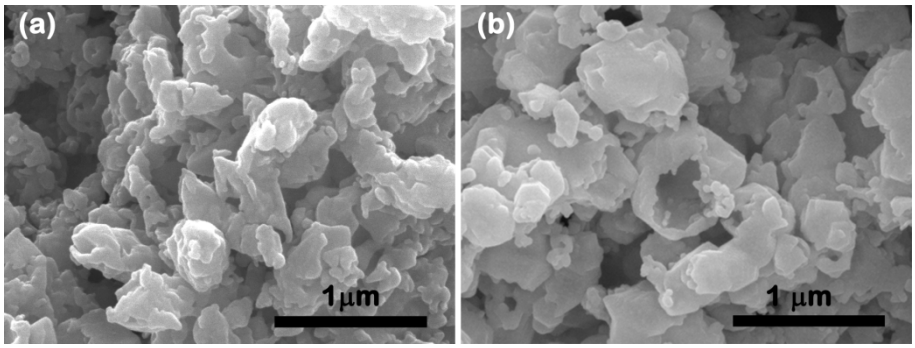

Fig. S5 SEM image of pristine GZNO (a) and 3% La GZNO (b). No hollow structure as that of 3% La GZNO is observed but polyhedral particles with different diameters are shown in the SEM image, indicating the addition of La_2O_3 plays an important in the formation of the hollow structure in the sample of 3% La GZNO.

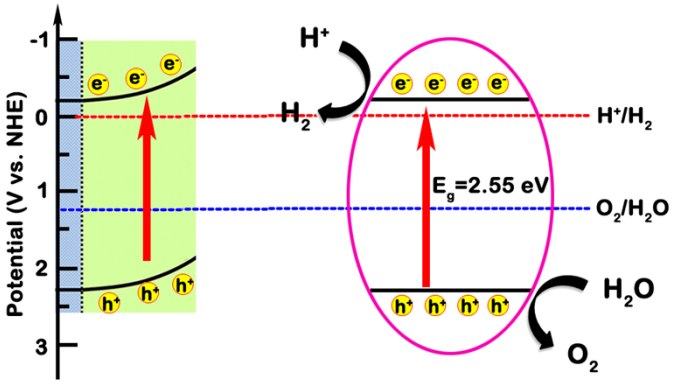

Fig. S6 illustration of the band position and charge transfer mechanism in the photocatalyst.

Table S1. The crystallinity calculated from (100) peak for the samples doped with different amount of La.

Samples	Crystallinity (%)
pristine GZNO	92.15
1% La GZNO	89.58
2% La GZNO	84.80
3% La GZNO	84.17
4% La GZNO	83.99
5% La GZNO	83.46

References

1. C. D. Wagner and G. E. Muilenberg, *Handbook of x-ray photoelectron spectroscopy: a reference book of standard data for use in x-ray photoelectron spectroscopy*, Physical Electronics Division, Perkin-Elmer Corp., 1979.