Supporting Information

Photothermal Effect: An Important Aspect for Enhancement of Photocatlytic Activity Under Illumination to NIR Radiations

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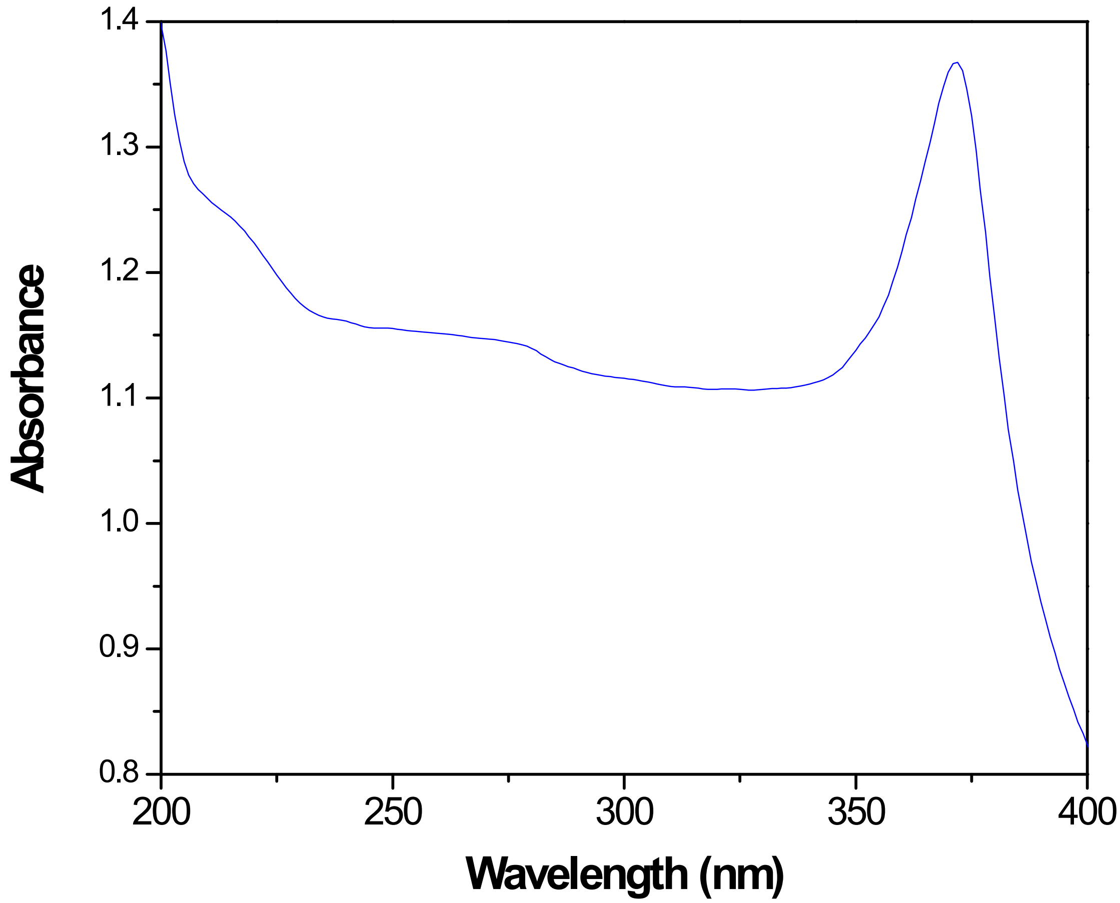

Figure S1. The absorption spectrum of GR-ZnO nanocatalyst in specified region.

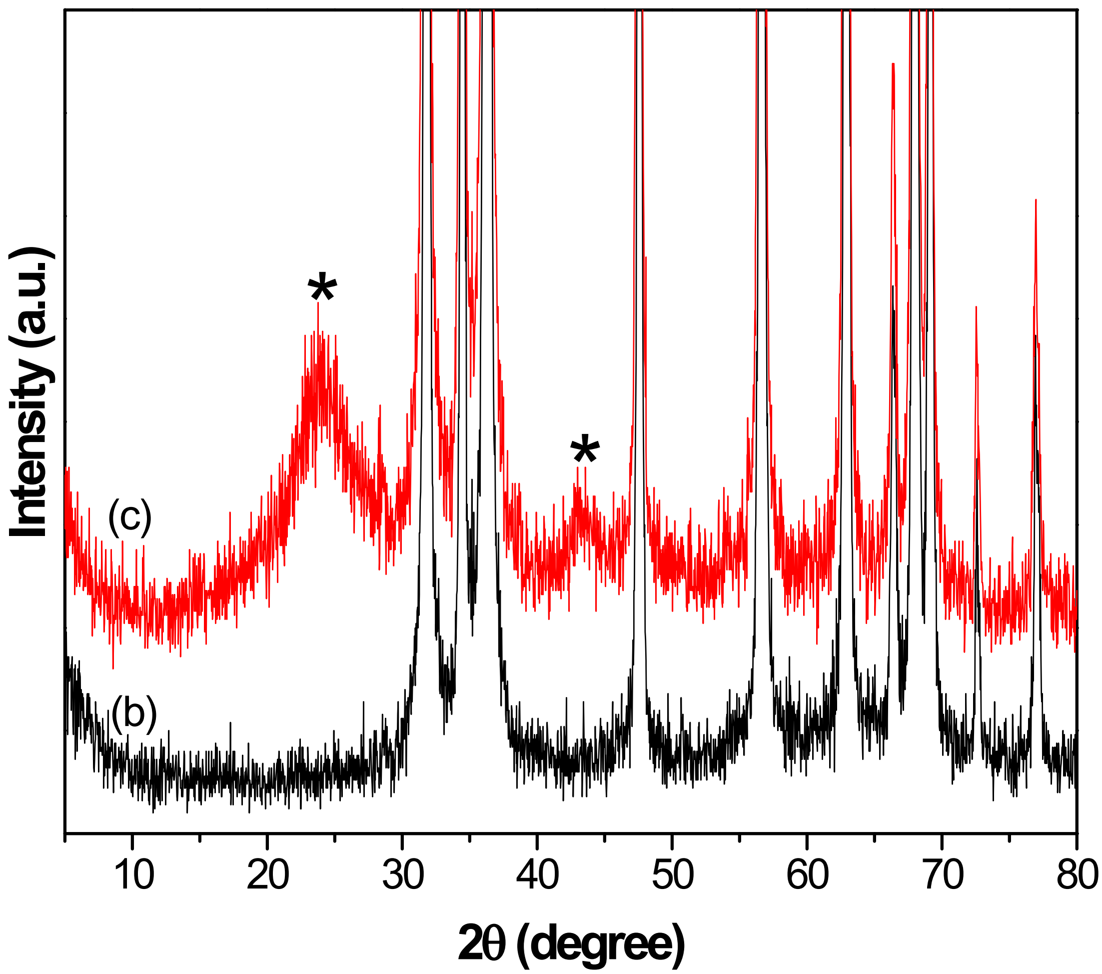

Figure S2. Magnified image of XRD patterns of (3b) ZnO and(3c) GR-ZnO nanocatalyst shown in Figure 3.

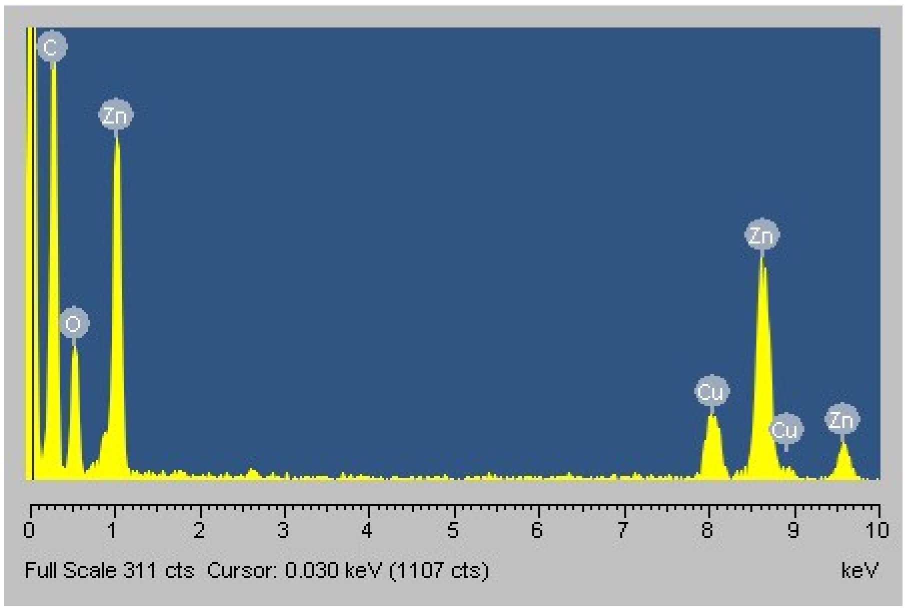

Figure S3. EDS of GR-ZnO nanocatalyst.

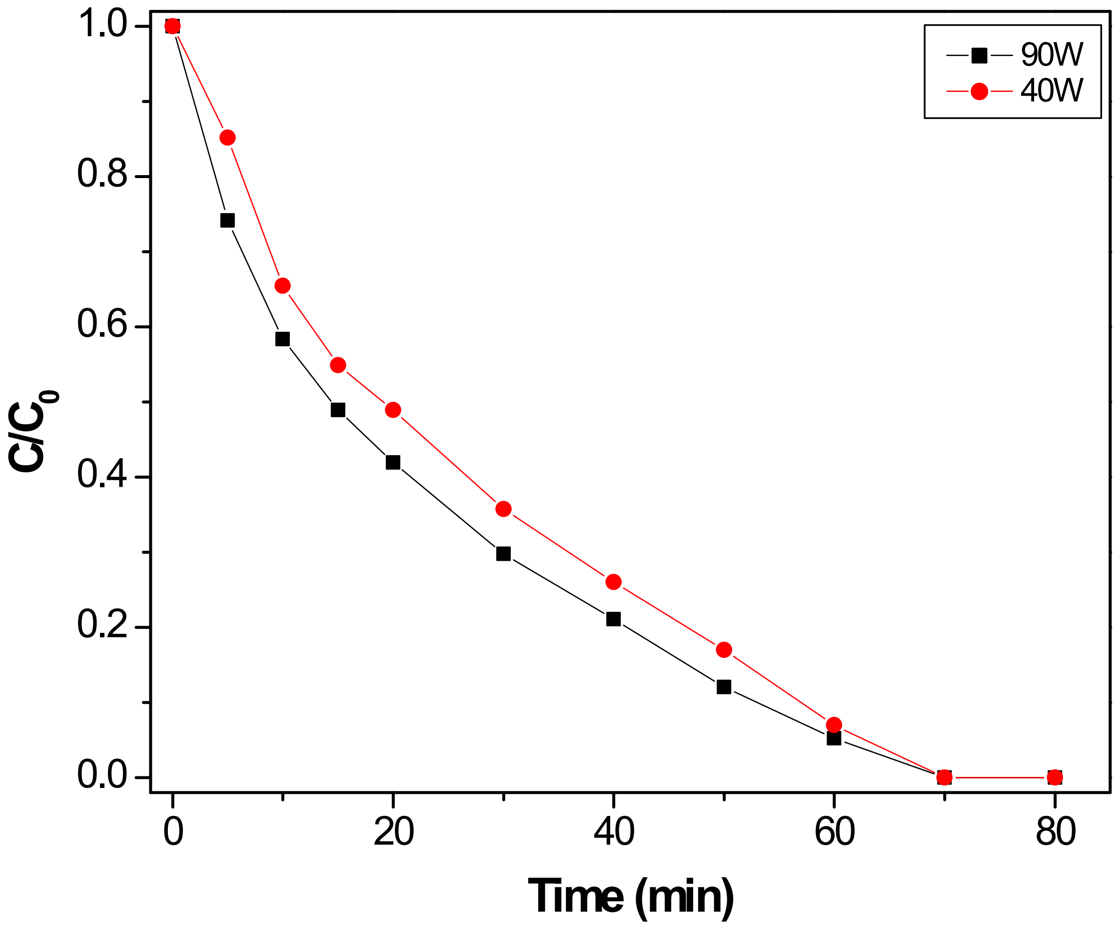

Figure S4. Photocatalytic degradation profile of methyl orange in presence of GR-ZnO nanocatalyst under exposure to 40 and 90W visible light.

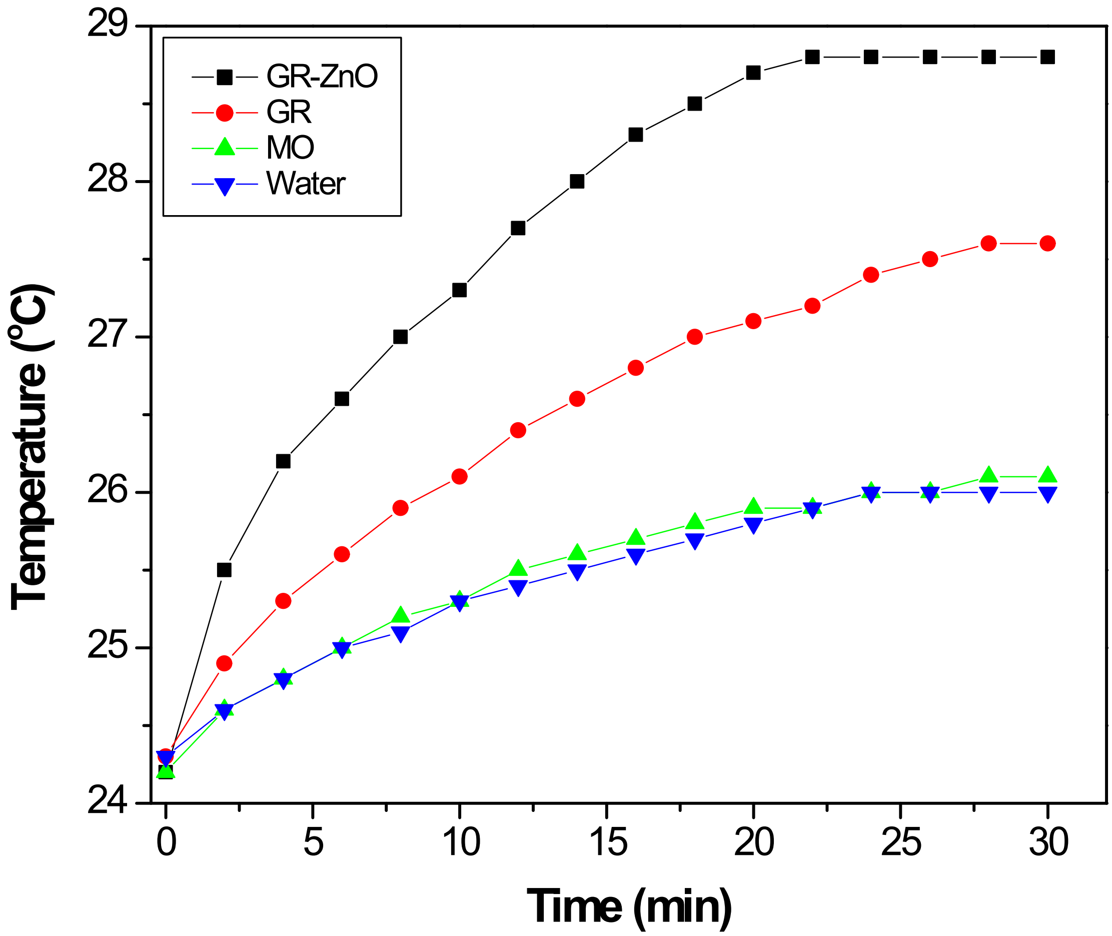

Figure S5. Temperature elevation measured for catalytic mixture under exposure to NIR laser without external circulation of water.

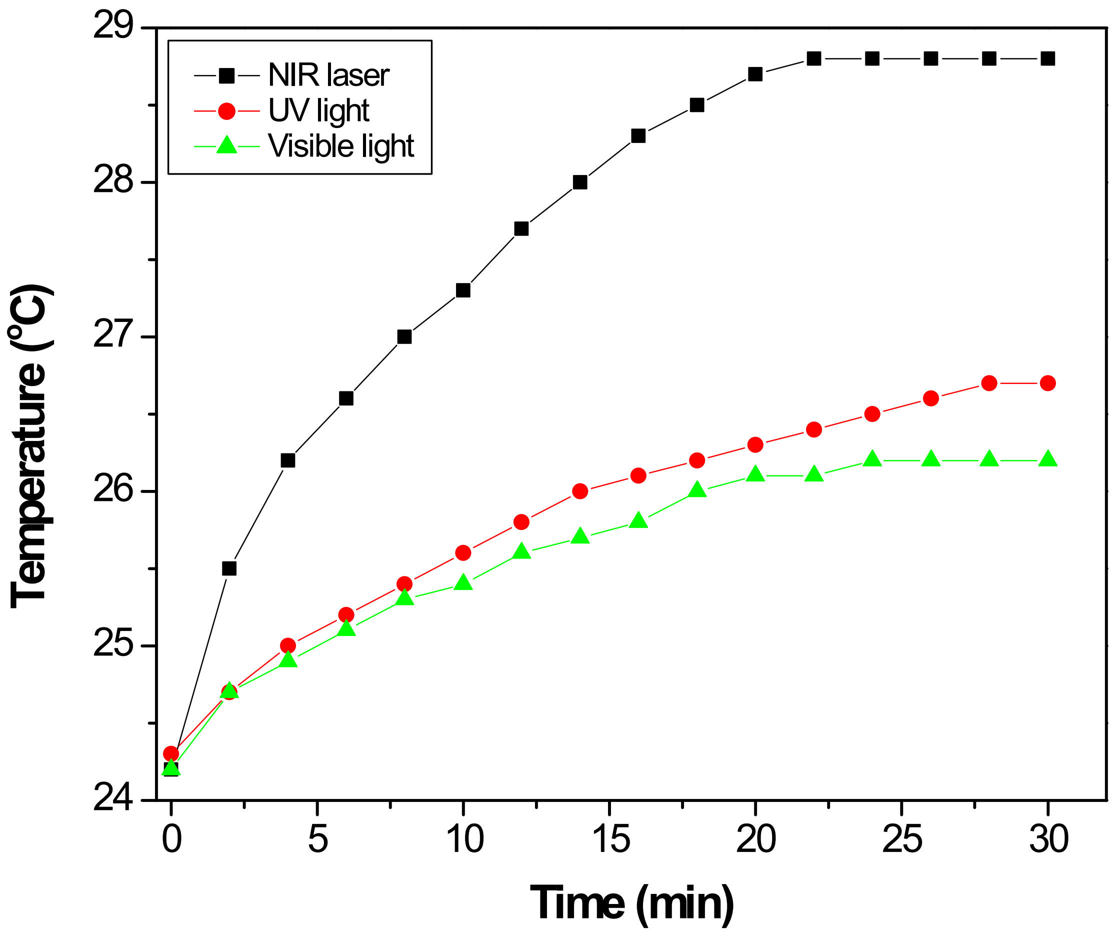

Figure S6. Temperature rise measured for catalytic mixture under exposure to UV light, visible light and NIR laser without external circulation of water.

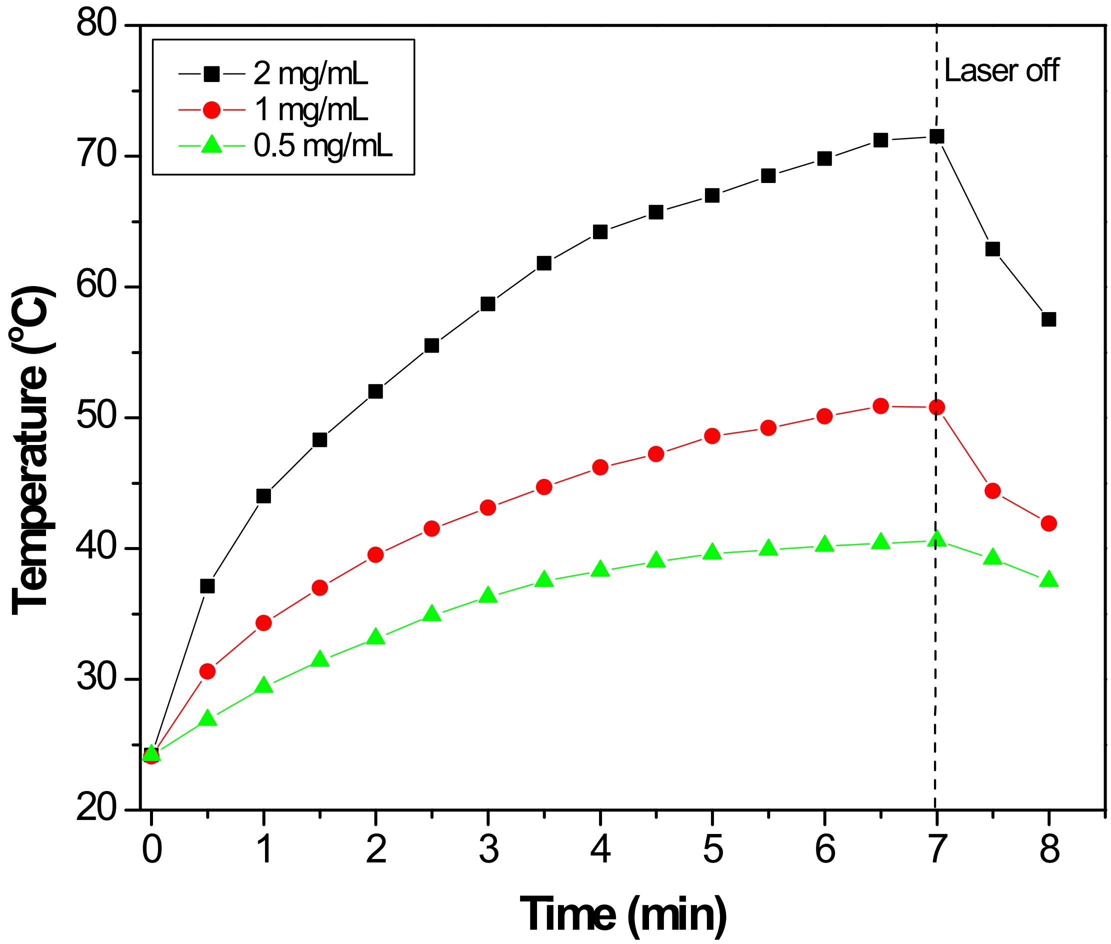

Figure S7. Temperature rise measured for GR-ZnO nanocatalyst under exposure 980 nm laser at its different concentration level.

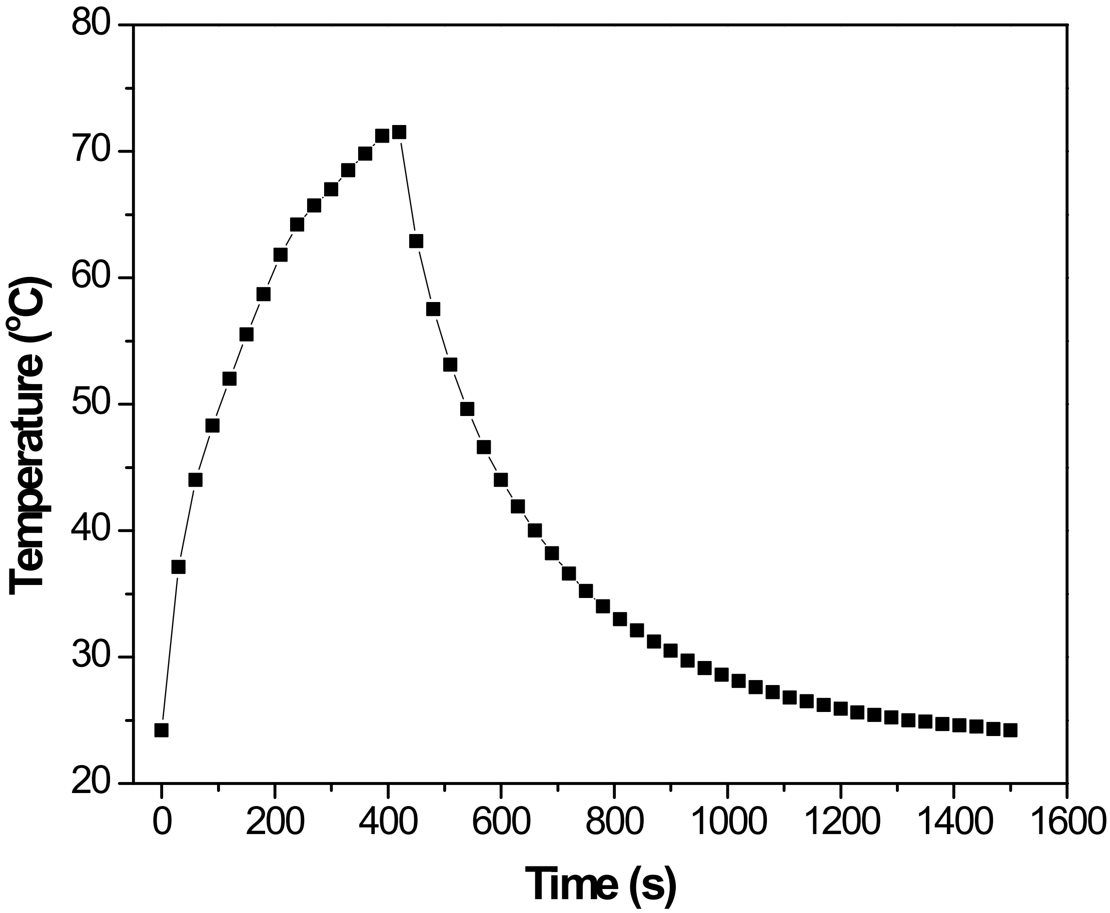

Figure S8. Temperature variation of aqueous dispersions of GR-ZnO nanocatalyst by irradiation with 980 nm laser for 7 min and followed by laser shut off.

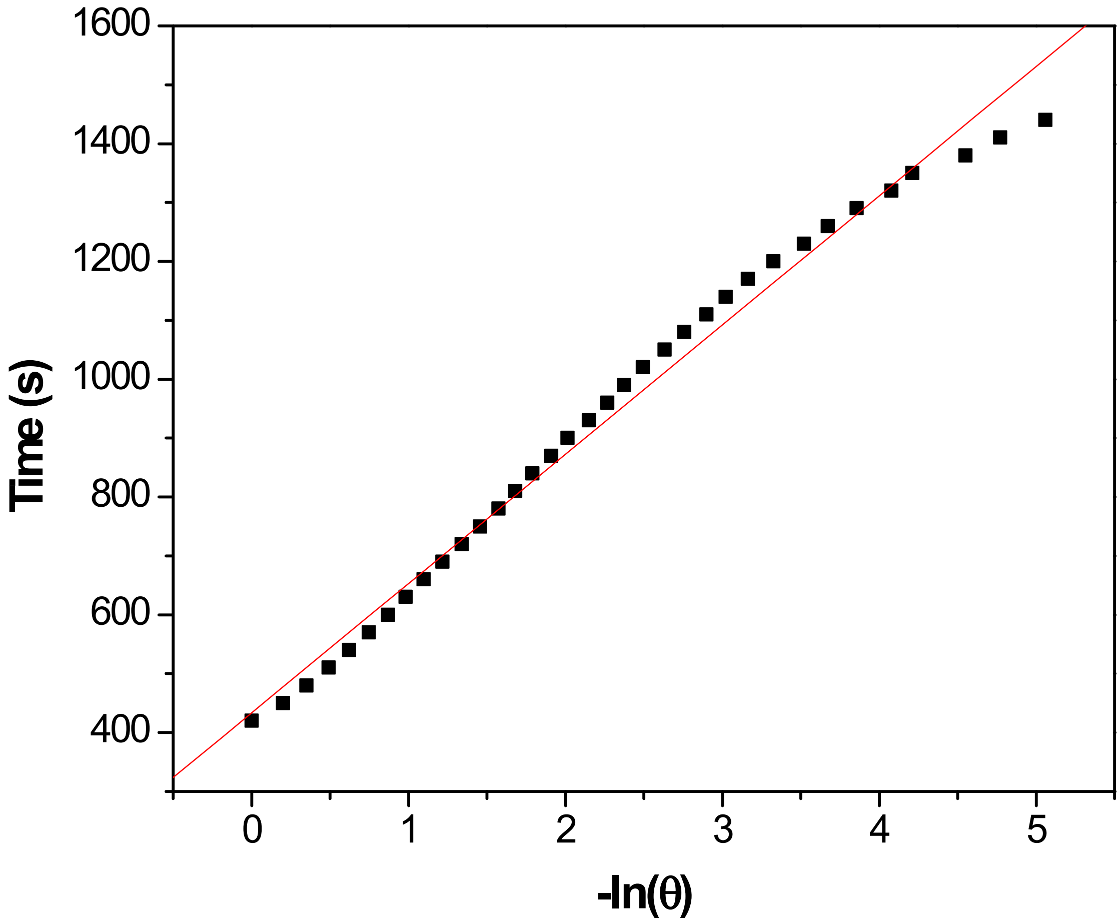

Figure S9. The plot of time from the cooling period versus negative natural logarithm of driving force temperature obtained for GR-ZnO nanocatalyst shown in Figure S5.

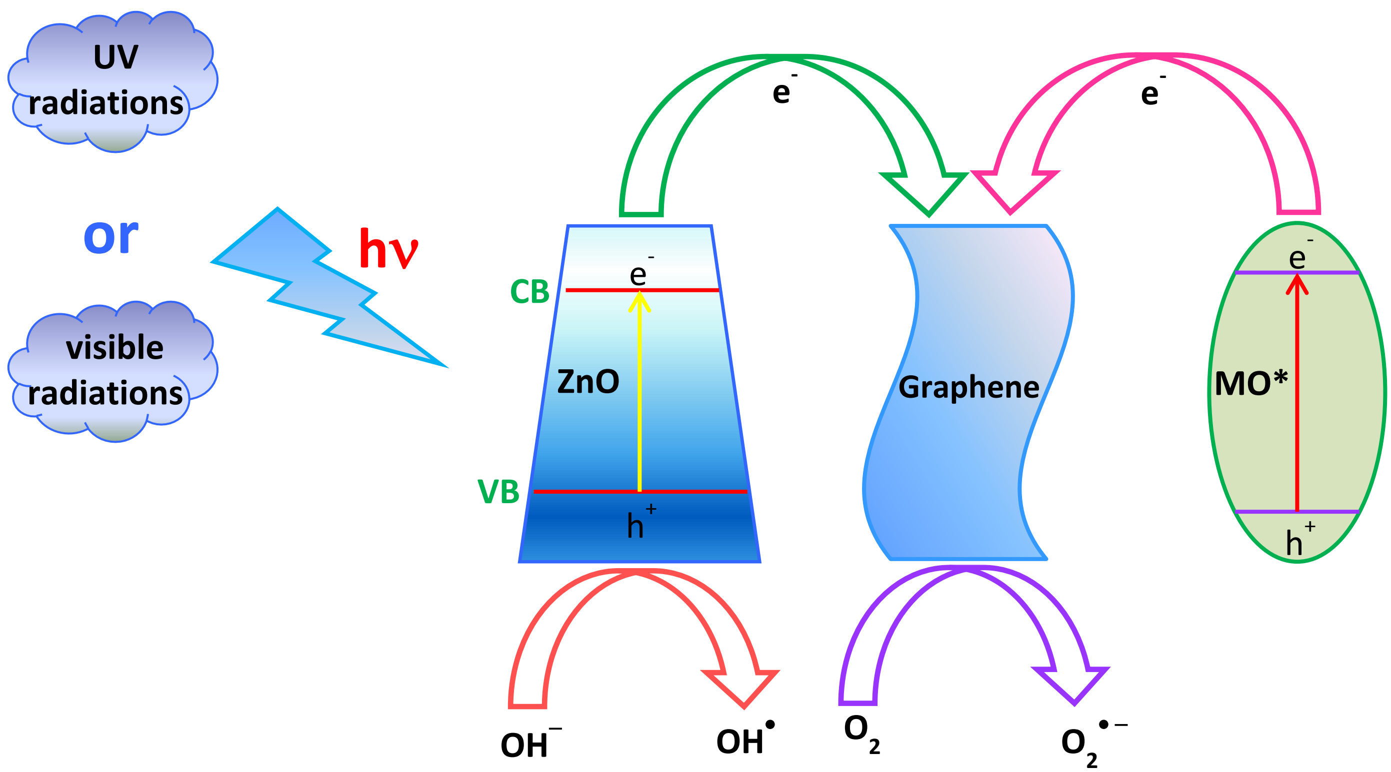

Figure S10. The proposed mechanism for photocatalytic degradation of methyl orange in presence of GR-ZnO nanocomposite under illumination to UV and visible light.

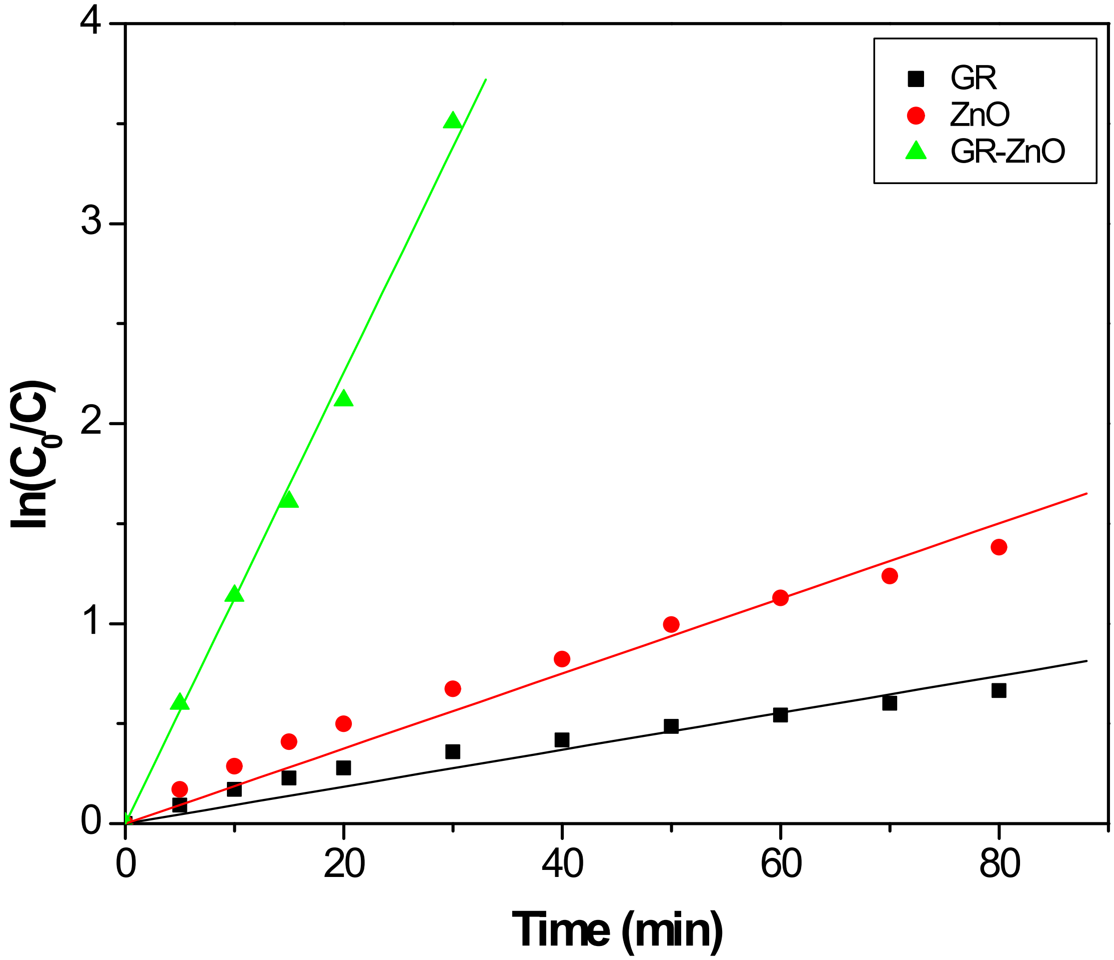

Figure S11. Langmuir-Hinshelwood plot for photodegradation of methyl orange under exposure to NIR laser.

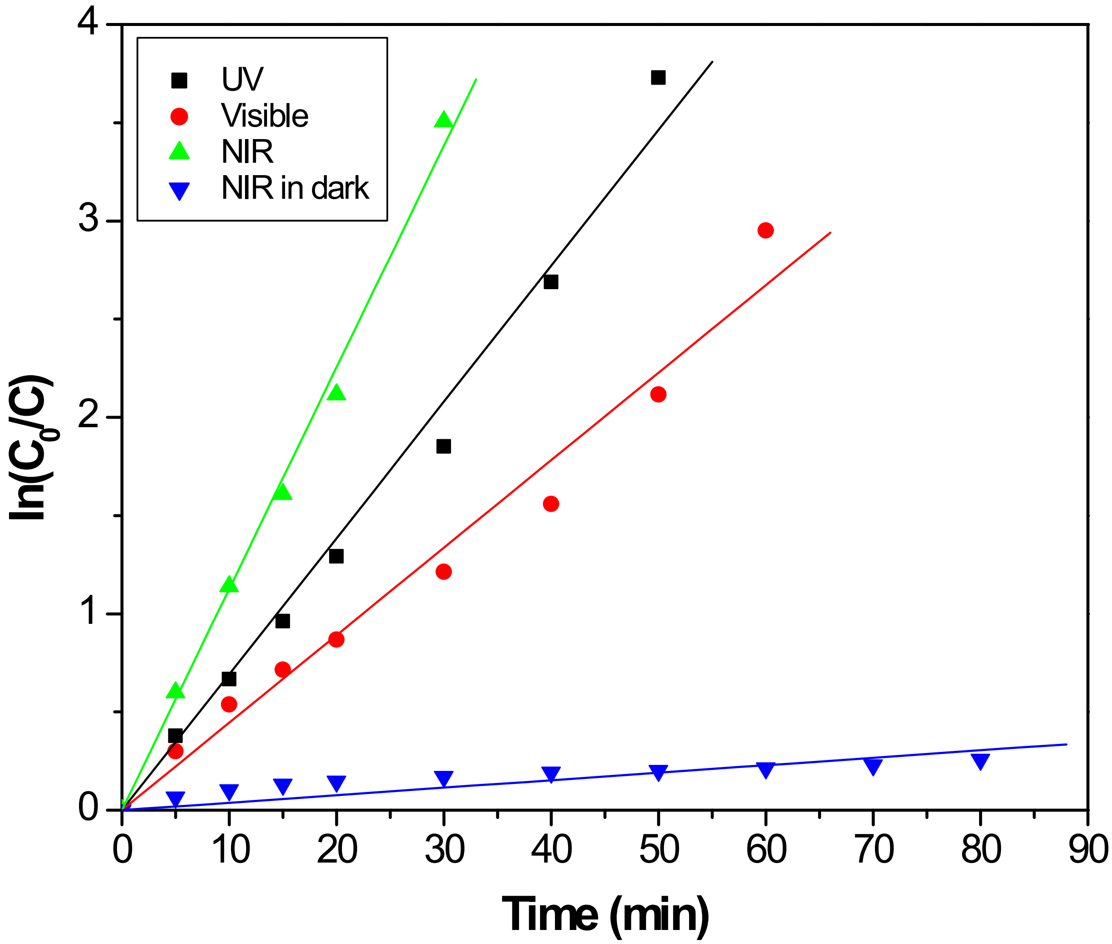

Figure S12. Langmuir-Hinshelwood plot for photodegradation of methyl orange under exposure to visible light, NIR laser and NIR laser in darkness.

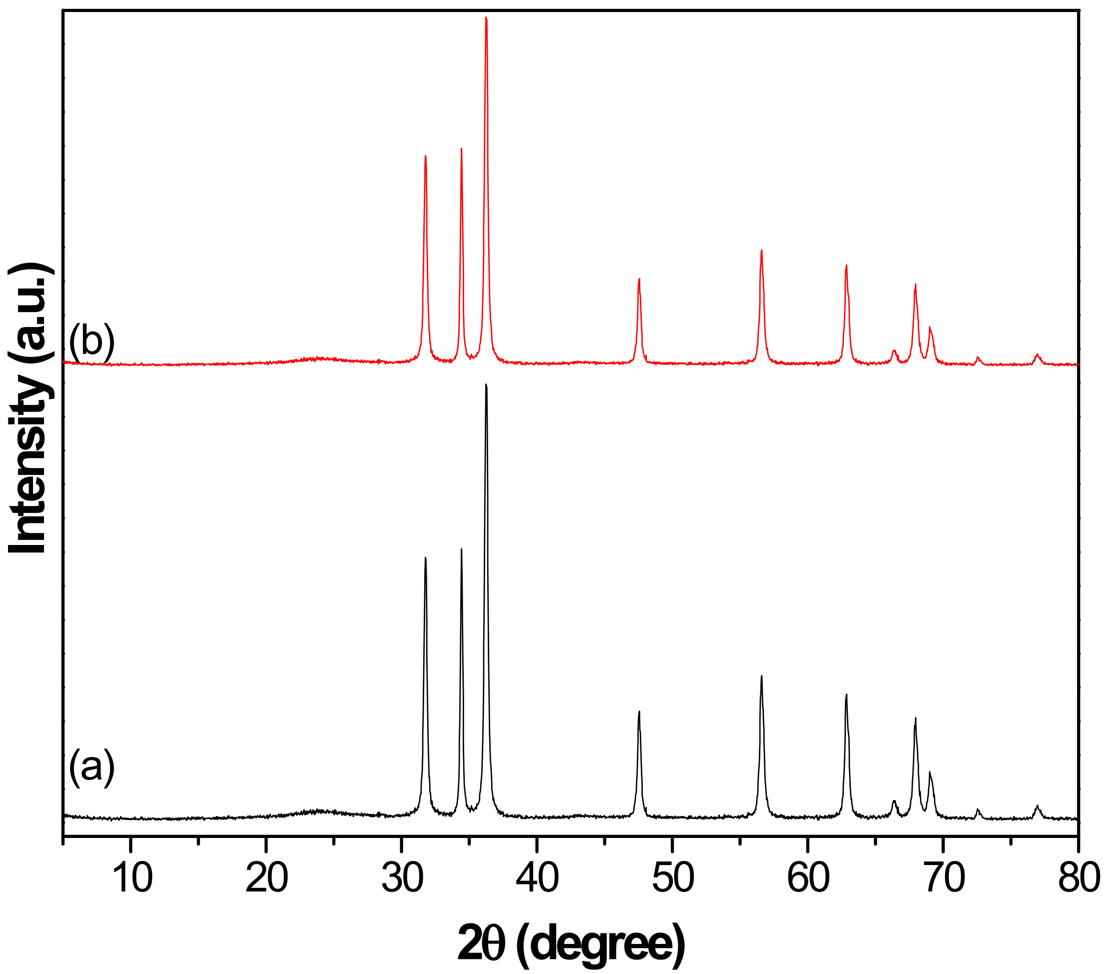

Figure S13. XRD patterns of GR-ZnO nanocatalyst (a) before and (b) after degradation of methyl orange under exposure to NIR laser.