Supporting Information

Nonlinear Optical Transmission of Nanographene and Its Composites

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I. Absorption Spectra Changes of Au-GS Before and After Laser Irradiation

Fig. S1. Absorption spectra of Au-GS suspension before and after laser irradiation. The absorbance near 532 nm for Au-GS increased after laser irradiation, indicating that the laser broke down the Au nanoparticles into smaller sizes due to laser photothermal reshaping, thus enhancing absorption effects at 532 nm.¹

II. Optical Limiting Responses of GS at 800 nm and 1300 nm

At 800 nm and 1300 nm, the GS suspension also shows stable limiting performance under 10 Hz repetitive pulses without bleaching, similar to that at 532 nm, demonstrating broadband limiting properties of GS.

Fig. S2. Optical limiting responses of GS in a THF suspension at 800 nm and 1300 nm. The nonlinear transmittance was measured as a function of number of laser pulses (2.8 mJ, 10 Hz).

III. Optical Limiting Responses of GO in Aqueous Solution and PVA Gel

As shown in Figure S3, the GO shows good limiting performance without bleaching that occurs in aqueous GS suspension (Figure 9 in the text) under 10 Hz repetitive pulses, and similar limiting performance of GO is kept in the gel matrix as well.

Fig. S3. Comparison of optical limiting responses of GO in a polymer gel matrix PVA with an aqueous GO suspension. The nonlinear transmittance was measured as a function of number of laser pulses (532 nm, 0.78 mJ, 10 Hz).

References:

1. El-Sayed M. A. *Acc. Chem. Res.* **2001**, *34*, 257-264.