Reply to "Comment on `Upconversion and Downconversion Fluorescent Graphene Quantum Dots: Ultrasonic Preparation and Photocatalysis'"

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■ As Tan *et al.* noticed, the second-order diffraction light of wavelength $\lambda/2$ coexists in the first order of wavelength λ from the monochromators of the spectrofluorimeter.[1] To eliminate the influence of the second-order diffraction light of wavelength $\lambda/2$ and confirm the upconversion of our concentrated sample prepared by ultrasonic method,[2] its photoluminescence was measured with 643 nm laser (NanoLED-635L) as excitation, equipped in Horiba Jobin Yvon FL-1057 spectrofluorimeter, as shown in Figure 1. There is a peak around 410 nm, which is the upconversion of the sample.

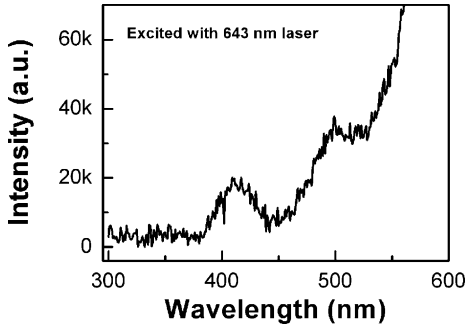

Figure 1. Upconversion of graphene quantum dots excited with a 643 nm laser.

The photoluminescence curve in Figure 1 may be employed to explain that the photocatalysis of the rutile TiO_2/GQD complex system was better than that of the anatase TiO_2/GQD complex under visible light ($\lambda > 420$ nm) irradiation in the degradation of methylene blue.

As for the term "downconversion", it may also be used for normal photoluminescence in various reports (one high-energy photon produces one lower energy photon), while the term "multiple exciton generation" was adopted where absorption of one photon can produce more than one electron−hole pair.[3]

REFERENCES AND NOTES

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