

Catalog # 06-0330 Graphene Quantum Dots (GQDs), Aqua-Green Luminescent

Color and Form:	dark red-brown powdr.
Photoluminescence:	Absolute quantum yield: >17% Maximum excitation wavelength: 485 nm Maximum emission: 525 nm Full width at half maximum: 70 nm
Particle Size:	Particle diameter: <5 nm

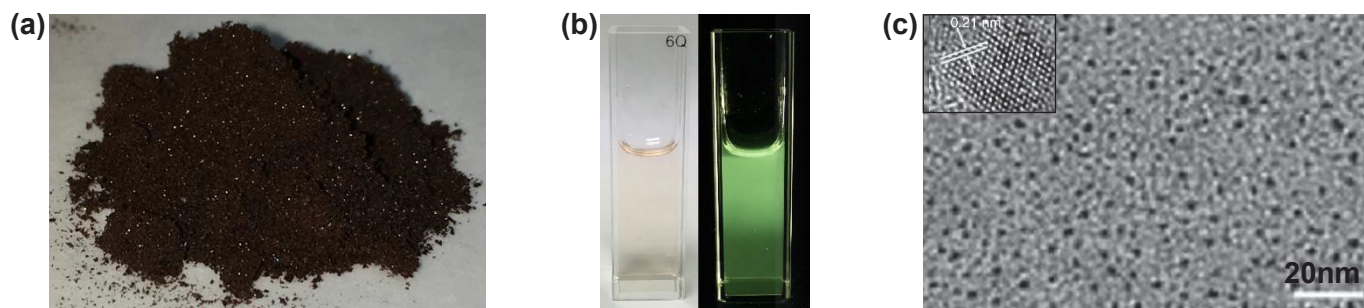
Instructions for Storage and Handling: Use within 6 months of purchase. Do not freeze. Store in dark.

Suggested Applications:

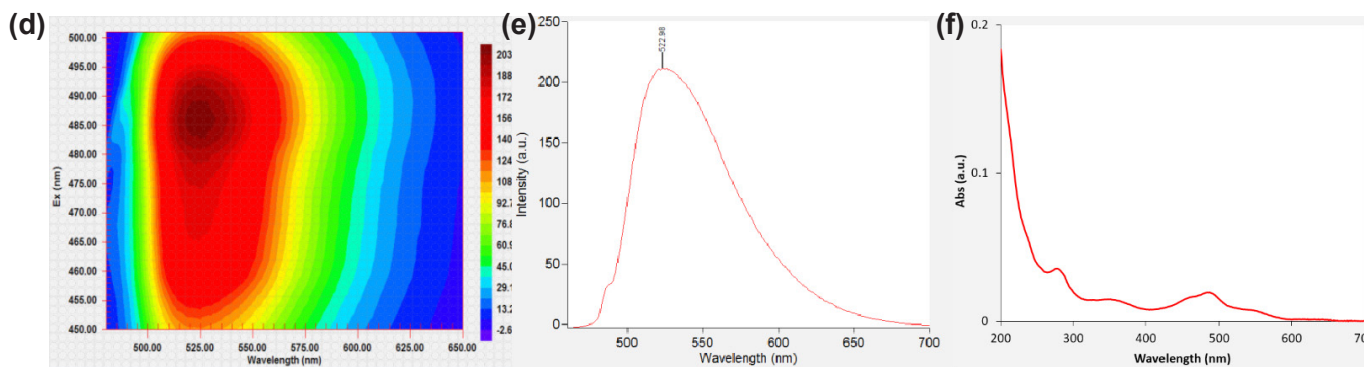
Graphene quantum dots (GQDs), sheets of few-layered graphene and lateral dimensions smaller than 100nm, possess strong quantum confinement and edge effects. Thus, they possess unique physical properties such as strong photoluminescence, which can be tailored for specific applications by controlling their size, shape, defects, and functionality.

In contrast to classic QDs, such as metal or silicon quantum dots, GQDs are biocompatible, photostable, and inherit superior thermal, electrical and mechanical properties from the graphene. These features can greatly contribute to various state-of-the-art applications:

- Optical brighteners
- Taggants for security application¹
- Bioimaging markers²
- Fluorescent polymers³
- Antibacterial⁴, antibiofouling⁵, and disinfection systems
- Heavy metals⁷, humidity and pressure⁸, sensors
- Batteries⁹
- Flash memory devices¹⁰
- Photovoltaic devices¹¹
- Light-emitting diodes¹²



(a) Optical image of 5 grams of GQDs powder.
 (b) Optical image of GQDs powder suspended in water under visible (left) and 365nm UV light (right).
 (c) Typical TEM image of GQDs. Inset: HR-TEM image of GQD.



(d) Excitation and emission contour map of GQDs.
 (e) Photoluminescence emission of GQDs excited at 485 nm.
 (f) Absorption spectra of GQDs.

References:

1. <http://onlinelibrary.wiley.com/doi/10.1002/anie.201206791/abstract>
2. <http://onlinelibrary.wiley.com/doi/10.1002/ppsc.201400219/abstract>
3. <http://pubs.acs.org/doi/abs/10.1021/acsami.5b06057>
4. <http://pubs.acs.org/doi/abs/10.1021/acsami.6b01765>
5. <http://www.nature.com/articles/srep20142>
6. <http://pubs.acs.org/doi/abs/10.1021/nn501640q>
7. <http://www.sciencedirect.com/science/article/pii/S0013468615000468>
8. <http://pubs.acs.org/doi/abs/10.1021/nl4003443>
9. <http://pubs.acs.org/doi/abs/10.1021/nl504038s>
10. <http://iopscience.iop.org/article/10.1088/0957-4484/25/25/255203/meta>
11. <http://onlinelibrary.wiley.com/doi/10.1002/anie.200906291/abstract>
12. <http://link.springer.com/article/10.1007/s10853-012-7016-8>

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