

Ester-Terminated Silicon Quantum Dots

Silicon Quantum dots as dry powder or dispersed in organic solvent

Description

Ester-terminated silicon quantum dots are readily dispersible in wide variety of organic solvents including toluene, dichloromethane, and ethanol. These particles can be used in photovoltaic devices, light emitting diodes, sensors, and optical film applications.

Advantages Over Traditional QDs

- Free of toxic metals (e.g., Cd, Pb, In) or phosphines
- Bright PL, tunable from 600 to 950 nm (visible to near-IR)
- Low self-absorption due to large Stokes-shift >400 meV
- Stable PL at elevated temperatures > 100°C and high humidity



Product Specifications

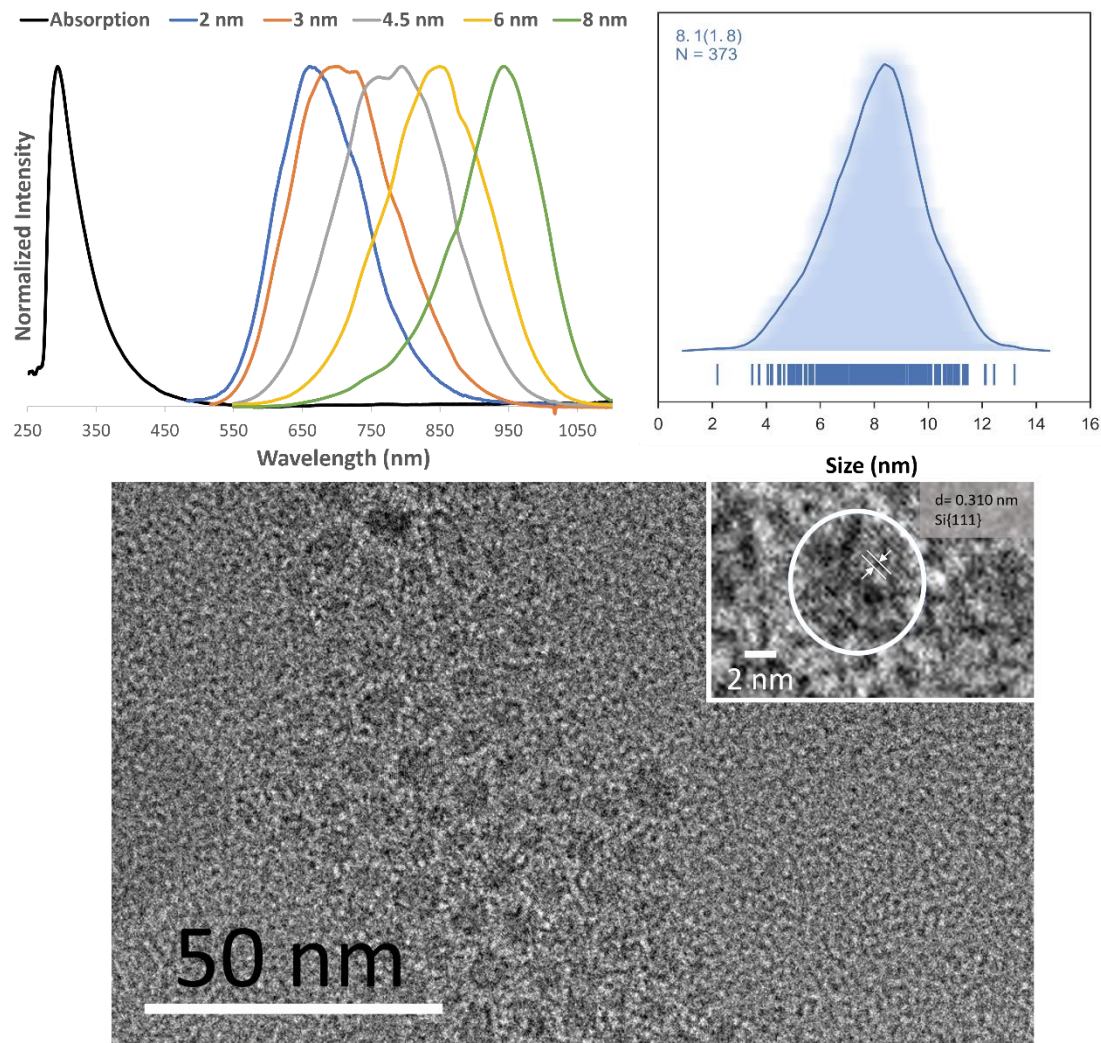
| | Size* | PL _{max} | Catalog No. |
|--|---------------------------------|-------------------|------------------------|
| Particle Sizes Available | 2.5 nm | 665 ± 20 nm | 14-0602-S2 |
| | 3 nm | 710 ± 20 nm | 14-0602-S3 |
| | 4 nm | 780 ± 20 nm | 14-0602-S4 |
| | 6 nm | 845 ± 20 nm | 14-0602-S6 |
| | 8 nm | 980 ± 20 nm | 14-0602-S8 |
| Material Composition | Silicon | | |
| Forms | Orange/red powders or solutions | | |
| Photoluminescence | λ _{em} 600 to 1015 nm | | |
| FWHM | <120 nm | | |
| PL Lifetime | >50 μs | | |
| Functionalization Method | | QY | Shelf Life |
| I | | 10-40% ± 5% | 12 months ¹ |
| II | | 30-60% ± 5% | 3 months ¹ |
| III | | Up to 85% ± 5% | 3 months ¹ |
| ¹ Note: The shelf life is approximate and require proper storage conditions. Materials improperly stored can oxidize and lose optical properties. | | | |

Uses & Handling Recommendations

- Shipped as powders or in solution. 1 mL, 5 mL, and 20 mL solution in glass vials (bulk can be supplied upon request).
- Typical concentrations ~ 3 mg/mL.
- Exposure of ester terminated SiQDs to water will cause oxidation. Minimize exposure to water whenever possible. Water soluble SiQDs can be made upon request.
- Sonication can be used to help disperse the alkyl terminated SiQDs in desired organic solvent (usually toluene, ethanol, and other polar organic solvents).

[Contact us](#) for purchasing/customization options. AQM can tailor the surface chemistry to provide SiQDs suitable for specific applications.

Characterization Data



Figures 1-3. Photoluminescent emissions; Particle size histogram; Bright field TEM image.