

# Alkyl-Terminated Silicon Quantum Dots

## Silicon Quantum Dots as dry powder or dispersed in organic solvent

### Description

Alkyl-terminated silicon quantum dots are readily dispersible in wide variety of non-polar organic solvents including toluene, hexane, chloroform or as a dry powder. 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 ~650 to 1000 nm (visible to near-IR)
- Low self-absorption due to large Stokes-shift >400 meV
- Stable PL at elevated temperatures > 200 °C and high humidity



### Product Specifications

	Size	PL <sub>max</sub>	Catalog No.
<b>Particle Sizes Available</b>	2 nm	665 ± 20 nm	14-0101-S2
	3 nm	710 ± 20 nm	14-0101-S3
	4 nm	780 ± 20 nm	14-0101-S4
	6 nm	845 ± 20 nm	14-0101-S6
	8 nm	980 ± 20 nm	14-0101-S8
<b>Material Composition</b>	Silicon		
<b>Forms</b>	Orange/red powders or solutions		
<b>Photoluminescence</b>	λ <sub>em</sub> 600 to 1000 nm		
<b>FWHM</b>	<120 nm		
<b>PL Lifetime</b>	>50 μs		
<b>Functionalization Method</b>		<b>QY</b>	<b>Shelf Life</b>
<b>I</b>		10 - 40% ± 5%	12 months <sup>1</sup>
<b>II</b>		30 - 60% ± 5%	3 months <sup>1</sup>
<b>III</b>		Up to 85% ± 5%	3 months <sup>1</sup>
<sup>1</sup> Note: The shelf life is approximate and requires 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 alkyl 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, hexanes, and other non-polar organic solvents).

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

## Characterization Data

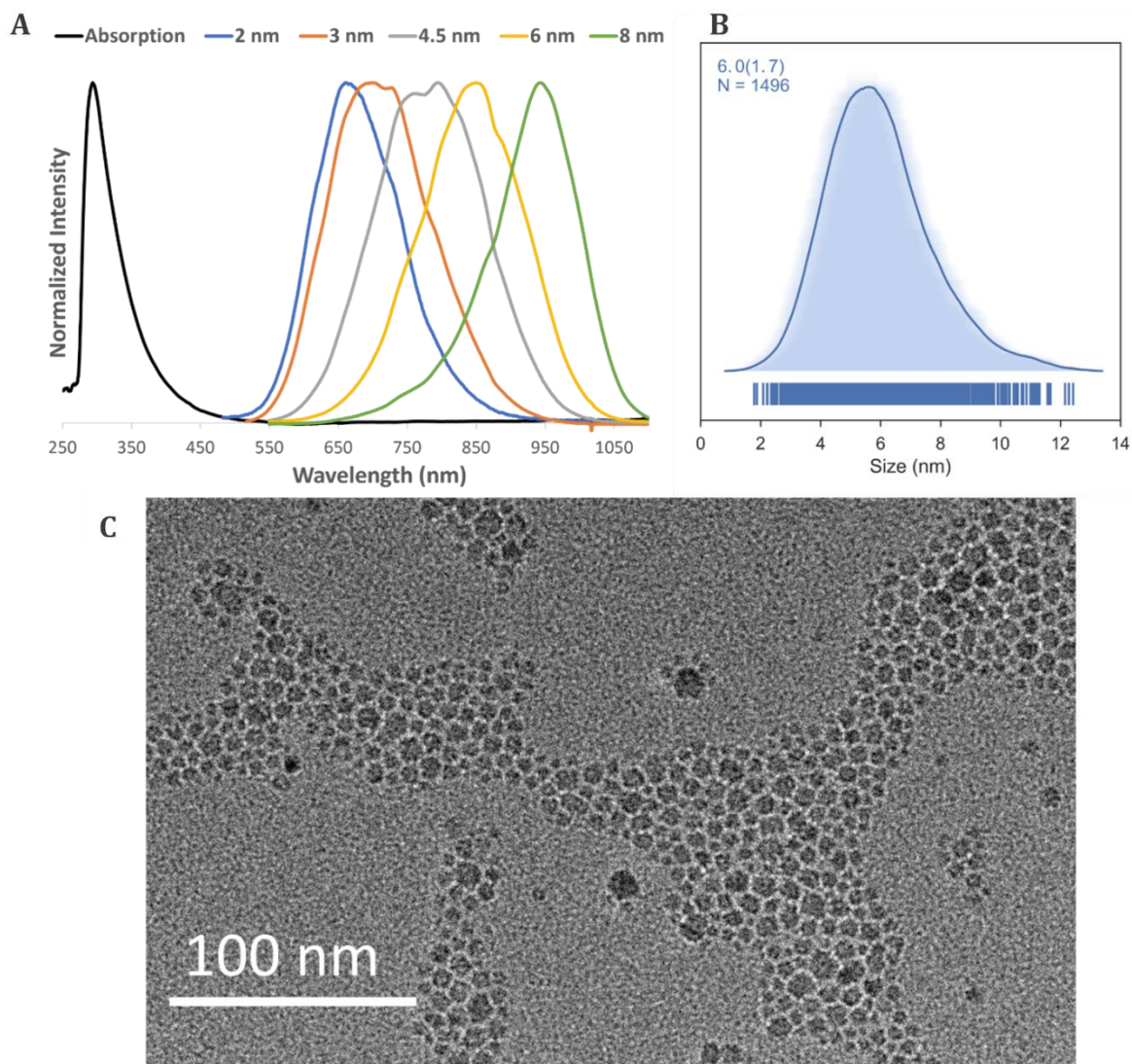


Figure 1. (A) Photoluminescent emissions; (B) Particle size histogram; (C) Bright field TEM image.