

# Near Infrared Silicon Quantum Dots

Silicon Quantum dots as a dry powder or dispersed in organic solvents

## Description

Silicon quantum dots are readily dispersible in wide variety of organic solvents including toluene, methanol, and ethanol. Functionalization of the particles enables compatibility with organic solvents or water. These particles can be used in photovoltaic devices, light emitting diodes, sensors, and thin film applications. SiQDs can be functionalized with a variety of polymers to create stable nanocomposite polymers.



### 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

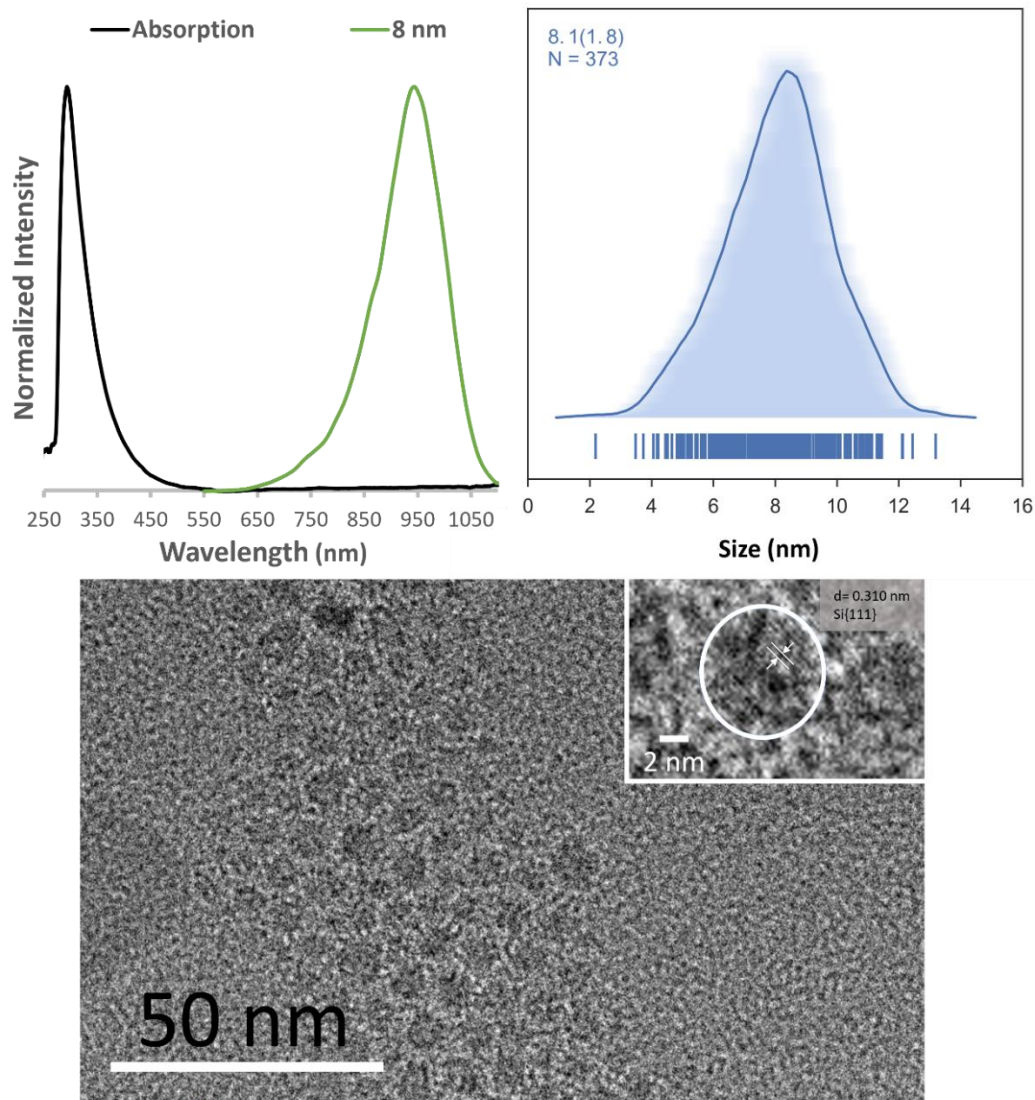
Functionalization's Available	Hydride, Alkyl, Ester, Acid, Polymers (e.g., PEG, polystyrene, or acrylates)
Material Composition	Silicon
Particle Size	6 - 10 nm
Forms	Orange/red powders or solutions
Photoluminescence	$\lambda_{em} = 800 - 950 \pm 20$ nm
FWHM	150 nm
PL Lifetime	>50 $\mu$ s
Quantum Yield	10 - 40% $\pm$ 5% depends on functionalization method and size

## 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 SiQDs to water will cause oxidation. Minimize exposure to water whenever possible. Water soluble SiQDs can be made upon request.
- SiQD powder can be stored in ambient conditions for up to a year.
- Sonication can be used to help disperse the SiQDs in desired organic solvent

[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.