

Perovskite APbX₃ Quantum Dots

Technical Data Sheet

QD-P-450	CsPb(Cl/Br) ₃ Perovskite quantum dots, 10 mg/mL in toluene, 450nm peak emission.
QD-P-480	CsPb(Cl/Br) ₃ Perovskite quantum dots, 10 mg/mL in toluene, 480nm peak emission.
QD-P-510	CsPbBr ₃ Perovskite quantum dots, 10 mg/mL in toluene, 510nm peak emission.
QD-P-510 powder	CsPbBr ₃ Perovskite quantum dots, powder, 510nm peak emission.
QD-P-520	CsPb(Br/I) ₃ Perovskite quantum dots, 10 mg/mL in toluene, 520nm peak emission.
QD-P-530	FAPbBr ₃ Perovskite quantum dots, 10 mg/mL in toluene, 530nm peak emission.
QD-P-650	CsPb(Br/I) ₃ Perovskite quantum dots, 10 mg/mL in octane, 650nm peak emission.
QD-P-685	CsPbI ₃ Perovskite quantum dots, 10 mg/mL in octane, 685nm peak emission.

Perovskite QDs are a new type of quantum dots that have been discovered recently and have the common formula APbX₃ where A is Cs or FA (formamidinium) and X is Cl, Br or I. They possess high photoluminescence efficiency (up to 100 %) and narrow band emission (< 20-25 nm), and exhibit chemical robustness. QUANTUM SOLUTIONS is an expert in synthesis of Perovskite Quantum Dots. We produce highly uniform quantum dots with precise control of emission peaks, narrow fluorescence bands and high quantum yields. Quality control is provided by the modern equipment: UV-vis-IR spectrometer, a fluorescence spectrometer with broadband and integrating sphere capability, Transmission electron spectroscopy and Diffractometer.

Application fields

Perovskite QDs emit light in the entire visible spectral region from 450 to 685 nm depending on particle sizes and compositions. The compelling combination of enhanced optical properties and chemical robustness makes Perovskite QDs appealing for optoelectronic applications. These cadmium free QDs with low lead content can be used as a photon converter in display applications (LCD backlighting or color filters), UV and X-ray photodetectors or as an active material in QD LEDs.

QD-P-510 powder is especially advantageous product for device fabrication as you can dissolve it in various non polar solvents in any concentrations (up to 50 mg/mL) and proceed with spin coating, blade casting and other processing.

Features

- Cadmium free, high efficient quantum dots for display applications. Low lead content.
- Wide products range from 450 to 685 nm of emission peaks for various applications.
- Bright color, narrow FWHM < 20-25 nm and high PLQY up to 100 %.

Specification: Perovskite QDs in toluene

Catalog Number	QD-P-450	QD-P-480	QD-P-510	QD-P-520	QD-P-530	QD-P-650	QD-P-685
Type	CsPb(Cl/Br) ₃	CsPb(Cl/Br) ₃	CsPbBr ₃	CsPb(Br/I) ₃	FAPbBr ₃	CsPb(Br/I) ₃	CsPbI ₃
Capping ligand	Oleic acid Oleylamine	Oleic acid Oleylamine	Oleic acid Oleylamine	Oleic acid Oleylamine	Oleic acid Octylamine	Oleic acid Oleylamine	Oleic acid Oleylamine
Solvent	Toluene	Toluene	Toluene	Toluene	Toluene	Octane	Octane
Concentration	10 mg/mL	10 mg/mL	10 mg/mL	10 mg/mL	10 mg/mL	10 mg/mL	10 mg/mL
Appearance	Colorless Liquid	Light green Liquid	Green liquid	Green liquid	Green Liquid	Red liquid	Deep red liquid
Emission peak	450 ± 5 nm Royal Blue	480 ± 5 nm Blue	510 ± 5 nm Pale green	520 ± 5 nm Green	530 ± 5 nm Green	650 ± 5 nm Red	685 ± 5 nm Deep red
FWHM	< 25 nm	< 25 nm	< 25 nm	< 25 nm	< 30 nm	< 45 nm	< 45 nm
PLQY	> 30%	> 50 %	> 70 %	> 70 %	> 70%	> 70%	> 70 %

Photo under UV light



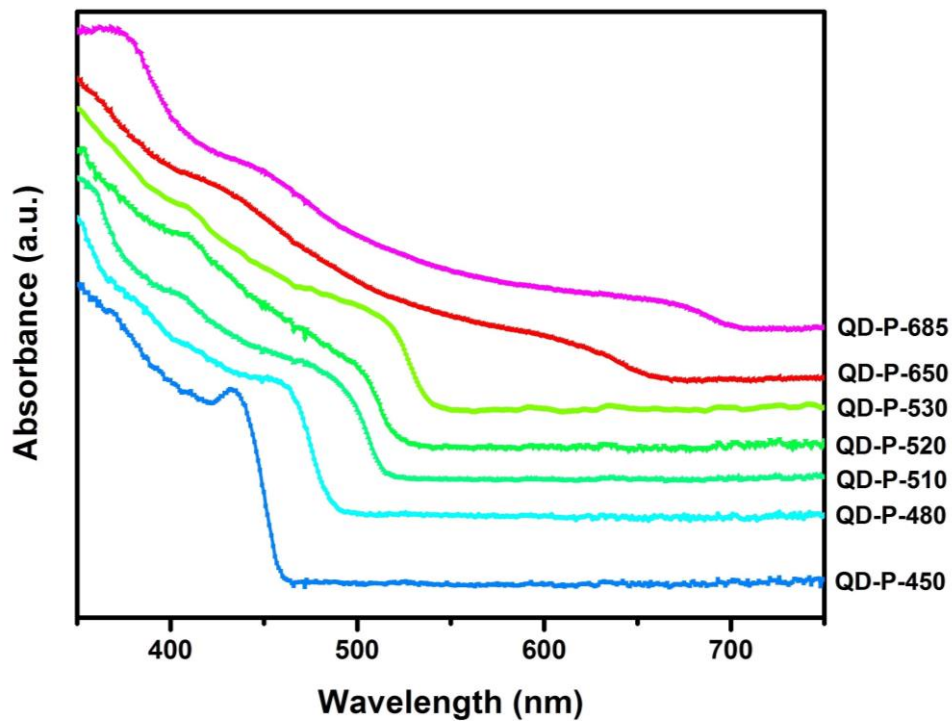
Specification: Perovskite QDs in powder form

Catalog Number	QD-P-510 powder
Type	CsPbBr ₃
Capping ligand	Oleic acid Oleylamine
Appearance	Green-yellow powder
Emission peak (in octane OD=1)	510 ± 5 nm Pale green
FWHM	< 25 nm
PLQY (in octane)	> 50-60 %
Solubility	Octane > 50 mg/mL Hexane > 50 mg/mL Toluene up to 20 mg/mL IBOA > 20 mg/mL

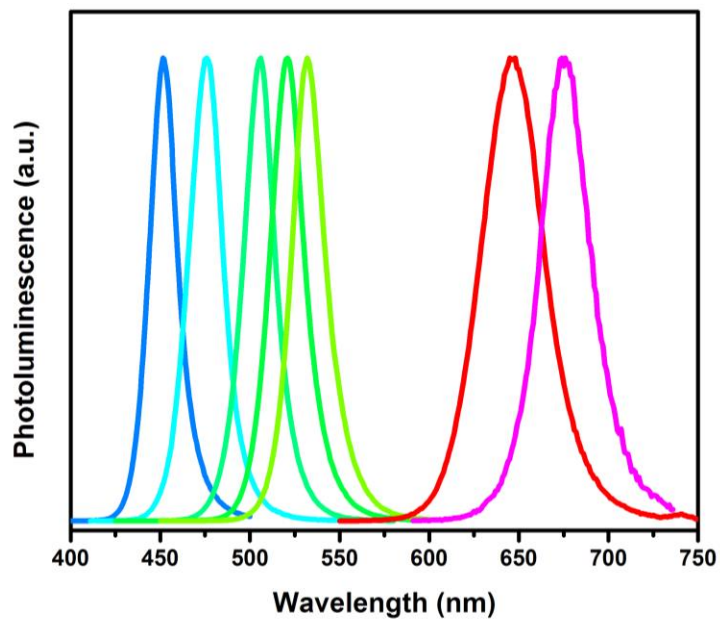
Photo



Absorption spectra



Emission spectra





Customized products

Perovskite Quantum Dots with different solvents, concentrations, emission peaks are available upon request.

Notes for handling

- Due to halide exchange, don't mix different perovskite QDs together!
- Products are miscible with nonpolar solvents: toluene, hexane, octane, benzene etc. Product in powder form is soluble in different nonpolar solvents in a wide range of concentrations up to:
 - Octane > 50 mg/mL
 - Hexane > 50 mg/mL
 - Toluene – up to 20 mg/mL
 - IBOA > 20 mg/mL
- Products are tested to be compatible with following polymers: PMMA, PP, PS, IBOA. For more information please contact info@quantum-solutions.com
- Products are degrade in polar solvents: water, alcohols, DMSO, DMF and others
- Shelf Life for QD-P-450, 480, 510, 510 powder and 530 – 1 year. Suggest to use within 6 months of purchase. Shelf Life for QD-P-520, 650 and 685 – 3 months. Suggest to use within 1-2 months of purchase. Store temperature 2-25 °C. Do not freeze. Store in DARK and DRY place, in sealed packaging or in a glovebox under N₂. Avoid long term contacts with air.

Packing

Glass vials of 10-30 ml.



QUANTUM SOLUTIONS

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