

Technical Data Sheet

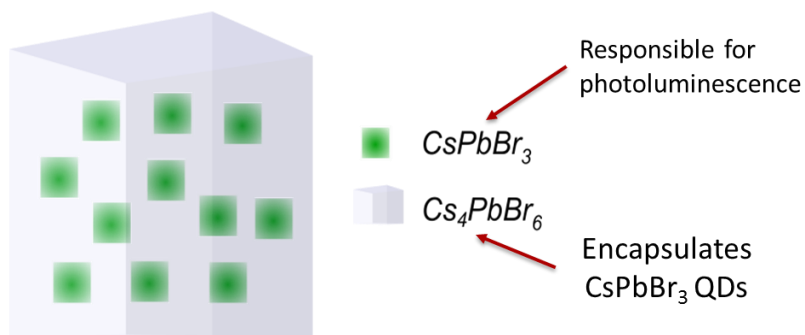
QDot™ Perovskite Cs₄PbBr₆ Powder

Version 3.1

Revised Date 12/09/2021

Introduction and product highlights

QDot™ Perovskite Cs₄PbBr₆ powder is a composite material that contains Perovskite CsPbBr₃ Quantum Dots that have been embedded into a transparent Cs₄PbBr₆ matrix, known as a zero-dimensional perovskite phase. The optical properties are similar to those of CsPbBr₃ QDs (emission peak 515 nm, FWHM < 25 nm, PLQY up to 70-80 %), but because these nanoparticles are encapsulated with Cs₄PbBr₆ phase, they show exceptional stability. This makes QDot™ Perovskite Cs₄PbBr₆ powder very promising for light conversion technologies, for example as a remote phosphor for lighting applications. This material is in powdered form, with μm size particles.



QDot™ Perovskite Cs₄PbBr₆ powder is chemically robust, and can withstand temperatures up to 180 °C in air for several hours. Because of the encapsulation matrix, 4-5 times more concentration of the material is required than genuine CsPbBr₃ QDs to achieve the same light intensity. QDot™ Perovskite Cs₄PbBr₆ powder has the following advantages:

1. Highly efficient and stable luminescence powder materials for photoluminescence applications.
2. Bright green luminescent colour (515 nm), narrow luminescence band (FWHM < 25 nm) and high photoluminescence quantum yield (PLQY is up to 70-80 %) in powder form.
3. High thermal stability

Application fields

QDot™ Perovskite Cs₄PbBr₆ powder's narrow emission peaks, high PLQY in powdered form and exceptional stability make this material very promising for light-to-light conversion technologies. This material can be used as a remote phosphor for lighting applications.

Specification of QDot™ Perovskite Cs₄PbBr₆ powder

Catalogue Number	QDot™ Cs ₄ PbBr ₆ powder
Type	Cs ₄ PbBr ₆
Appearance	Yellow-green powder
Emission peak	515 ± 5 nm
FWHM	≤ 25 nm
PLQY	> 45 %
Particle size	0.5 - 6 μm (average: 2 μm)
Dispersibility	Toluene - good Heptane - good Octane - good Acetone - no DMSO - poor, degrade Alcohols - degrade Water - degrade

Absorption and emission spectra

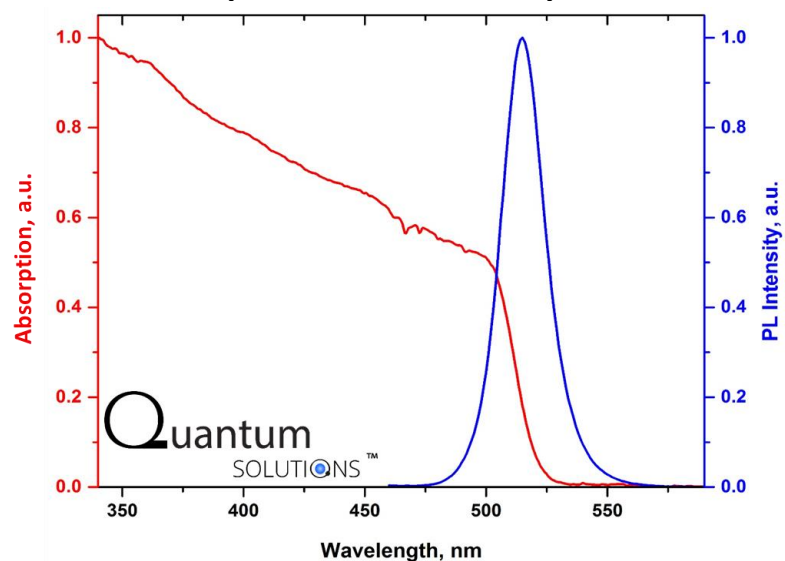
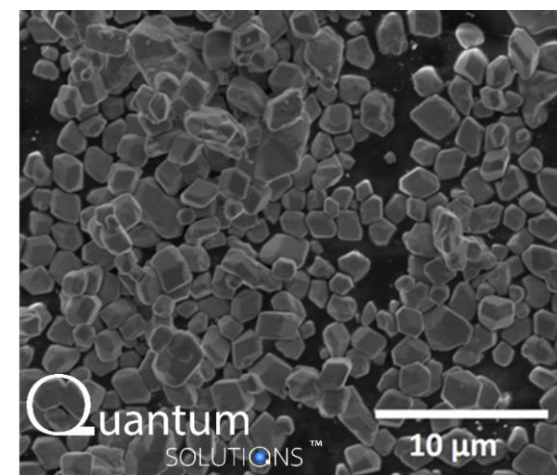


Photo under UV light



SEM image



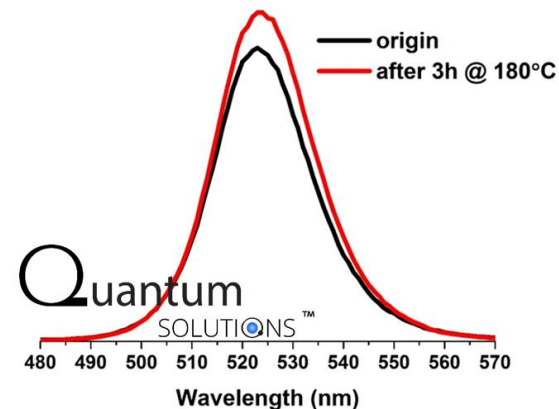
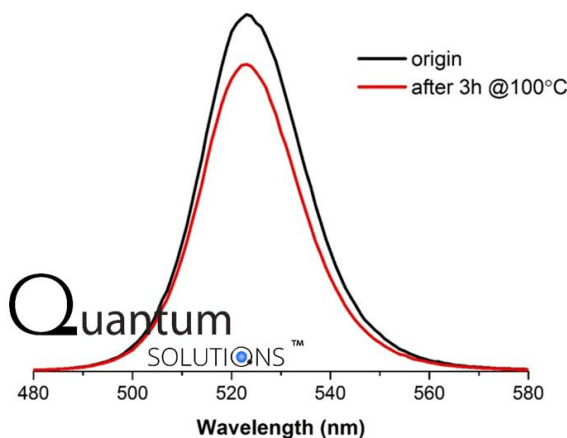
Thermal stability

QDot™ Perovskite Cs₄PbBr₆ powder retains 90 % of initial PL intensity after 3 hours of thermal exposure at 100°C in air and 3 hours of thermal shock at 180°C in nitrogen.

Photoluminescence

In air, 100 °C

In N₂, 180 °C



Notes for handling

Shelf Life 1 year. Store in temperatures from 2-25 °C. Store in DARK conditions, in sealed packaging or in a glovebox under N₂. This material is stable in air. Material is dispersible in nonpolar solvents: toluene, hexane, octane, benzene and other nonpolar solvents. Material is tested to be compatible with following polymers: PMMA, PP, PS, PDMS, UV curable resins. Material degrades in polar solvents: water, alcohols, DMSO, DMF and polar solvents.

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