

ABX₃ Perovskite Halide Single Crystals

Technical Data Sheet

SC-P-MAPbBr ₃	MAPbBr ₃ Perovskite single crystal	6 × 6 × 2 mm
SC-P-FAPbBr ₃	FAPbBr ₃ Perovskite single crystal	6 × 6 × 2 mm
SC-P-CsPbBr ₃	CsPbBr ₃ Perovskite single crystal	3 × 3 × 1 mm
SC-P-MAPbI ₃	MAPbI ₃ Perovskite single crystal	6 × 4 × 2 mm
SC-P-FAPbI ₃	FAPbI ₃ Perovskite single crystal	6 × 4 × 2 mm

Lead halide perovskite (APbX₃) single crystals have attracted considerable interest for optoelectronic applications due to high light absorption coefficients, long-range balanced electron and hole transport, and facile preparation techniques. QUANTUM SOLUTIONS is an expert in synthesis of high quality Single Crystals, Quantum Dots, Nanoparticles and other advanced materials. QUANTUM SOLUTIONS founders are inventors of synthesis of high quality Perovskite Halide Single Crystals by inverse temperature crystallization technique. Quality control is provided by the modern equipment: UV-vis-IR spectrometer, a fluorescence spectrometer with broadband and integrating sphere capability, Transmission/scanning electron spectroscopy and Diffractometer.

Application fields

Lead trihalide single crystals ABX₃ were shown to possess long carrier diffusion lengths and a remarkably low trap-state densities, which is comparable to the best photovoltaic-quality silicon. Therefore they have been widely investigated for solar cells, lasing, light-emitting diodes, photodetectors and hydrogen production.

Features

- Large (up to 6 mm) high quality single crystals for optoelectronic applications
- Tunable bandgap in the range between 1.41 – 2.21 eV
- Long carrier diffusion lengths (> 4 μm) and remarkably low trap densities (<10¹² cm⁻³)

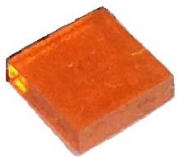


Specification

Catalog Number	SC-P-MAPbBr ₃	SC-P-FAPbBr ₃	SC-P-CsPbBr ₃	SC-P-MAPbI ₃	SC-P-FAPbI ₃
Type	MAPbBr ₃ (MA – CH ₃ NH ₃ ⁺)	FAPbBr ₃ (FA - NH ₂ CH=NH ₂ ⁺)	CsPbBr ₃	MAPbI ₃ (MA – CH ₃ NH ₃ ⁺)	FAPbI ₃ (FA - NH ₂ CH=NH ₂ ⁺)
Purity	> 99.9 %	> 99.9 %	> 99.9 %	> 99.9 %	> 99.9 %
Appearance	Orange crystal	Orange crystal	Orange crystal	Black crystal	Black crystal
Crystal Shape	Cuboid	Cuboid	Cuboid	Dodecahedral	Dodecahedral
Crystal Size	6 × 6 × 2 mm	6 × 6 × 2 mm	3 × 3 × 1 mm	6 × 4 × 2 mm	6 × 4 × 2 mm
Band gap	2.18 eV	2.15 eV	2.21 eV	1.51 eV	1.41 eV
PL peak position	575 ± 15 nm	590 ± 15 nm	560 ± 15 nm	820 ± 15 nm	840 ± 15 nm

Single Crystals Photo

MAPbBr₃



FAPbBr₃



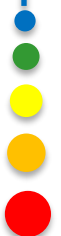
CsPbBr₃



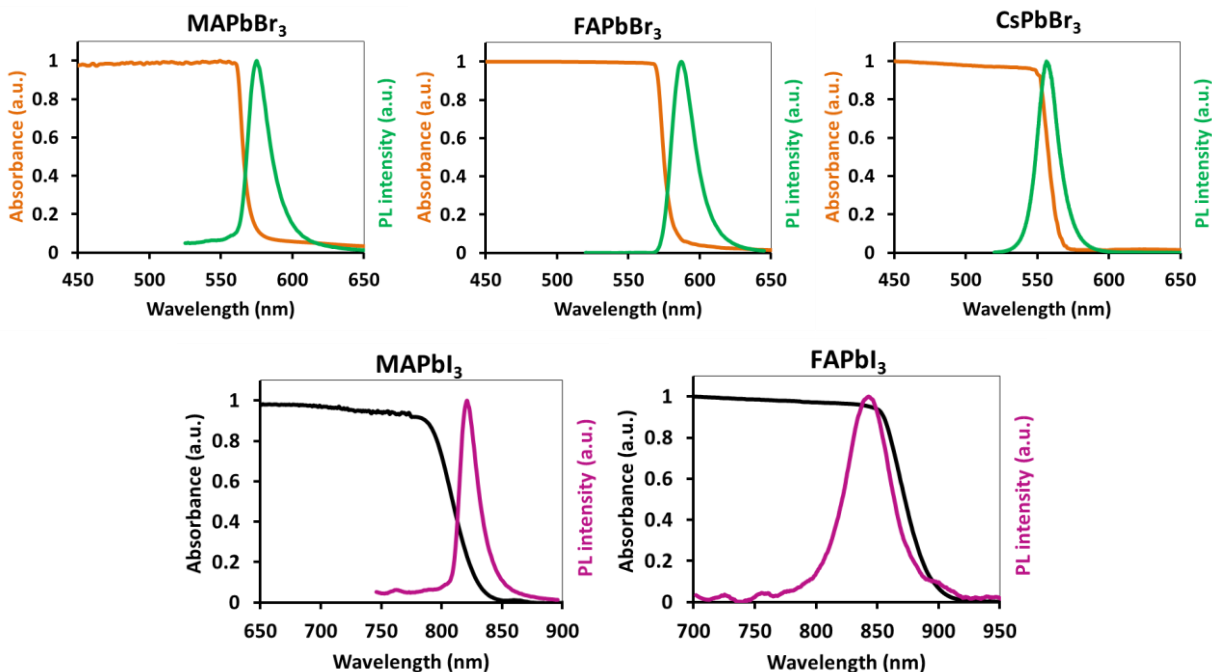
MAPbI₃



FAPbI₃



Absorption and emission PL



Customized products

ABX₃ Perovskite Halide Single Crystals with different sizes and compositions are available upon request.

Notes for handling

Shelf Life for single crystals is 6 months, except MAPbI₃ – 10 days. Storing temperature 2-25 °C. Store in DARK and DRY place, in original or airtight sealed packaging or in a glovebox under inert atmosphere.

Packing

Sealed glass (10 mL) vials wrapped by airtight plastic packing.



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