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QUANTUM DOTS FOR ELECTRONIC AND LIFE SCIENCE APPLICATIONS

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Quantum Dots for various applications

Quantum dots (QDs) are semiconductor nanoparticles where the absorption properties and emission wavelength can be tuned by adjusting the particle size. In this way, the particle can be tailored to the requirements of the respective application.

Therefore, QDs can be used for a broad range of applications such as luminescent materials in (O)LEDs or displays, up-converters in photovoltaics, security features in banknotes or as sensors.

In addition, functionalization of the particle surface enables the use of QDs for analytics, bioanalytics and diagnostic applications by utilizing their unique luminescence properties. For all of the applications mentioned above, high-quality QDs with predictable and reproducible properties are required.

Quantum dots tailored to your needs

Producing high-quality nanoparticles requires technical know-how regarding the influential processing parameters. Fraunhofer IAP has developed several procedures for the synthesis and modification of QDs and can provide a wide variety of QD-materials. Besides conventional cadmium selenide and infrared active QDs, Fraunhofer IAP has developed environment-friendly indium phosphide and copper indium sulfide QDs for LED/OLED, display technologies and improvement of solar cell efficiency.

Recent developments have concentrated on water dispersible indium phosphide QDs for bioanalytical applications. Here, Fraunhofer IAP has developed a method to provide very stable indium phosphide quantum dots with a high quantum yield.

Fraunhofer IAP provides QDs tailored to your needs, covering the whole spectral range from blue to infrared with optimization of relevant parameters including emission wavelength, quantum yield, FWHM or stability in organic and aqueous phases or other matrices.