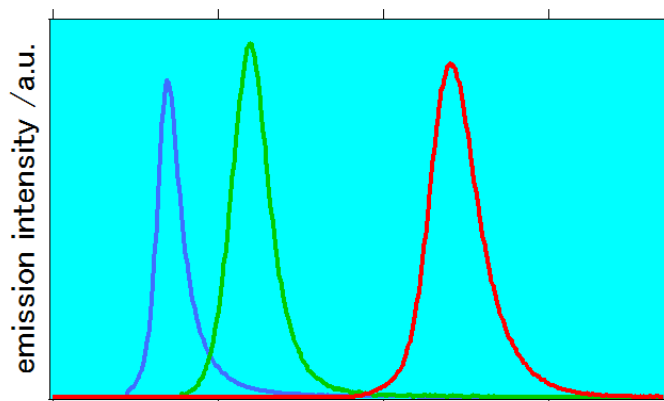


Perovskite Quantum Dots

Perovskite quantum dots are the nano crystal of perovskite type chemical crystal. We have mainly 2 types of perovskite quantum dots such as $\text{CH}_3\text{NH}_3\text{PbX}_3$, CsPbX_3 (X=Cl, Br, I). For display application, quantum dots such as CdSe/ZnS and InP/ZnS gradually have been used. Although toxicity of Cd, and the scarcity of In have been an issue. Furthermore, one would need the condition in which O_2 and H_2O needs to be completely shut out when synthesizing InP/ZnS so that chemical stability and durability of InP has been a problem. We have started to manufacture perovskite quantum dots in this regard. Quantum efficiency ranges 50 - 80%. Half width is quite narrow such as 18 nm - 39 nm. On top of its narrow half width and the fact that emission peak can be controlled, therefore, perovskite quantum dots have high possibility to be applied as organic EL, laser, LED and display etc... It should be noted that Pb free perovskite quantum dots are under development.



Emission spectra under 420 nm of irradiation light



Quantum Dot	excitation wavelength (nm)	emission peak (nm)	quantum efficiency (%)	half width (FWHM) (nm)	solvent
CsPbX_3 (X=Cl, Br, I)	420	460± 5	60 <	15 - 19	Hexane(Toluene)
$\text{CH}_3\text{NH}_3\text{PbX}_3$ (X=Cl, Br, I)	420	520± 5	60 <	20 - 29	Toluene (Xylene)
CsPbX_3 (X=Cl, Br, I)	420	640± 5	60 <	30 - 39	Hexane(Toluene)

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