

Enhanced stability of polyhedral oligomeric silsesquioxane (POSS)-caesium lead halide perovskite nanocrystals by module micro-reactor

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Perovskite quantum dots have received significant attention in recent years because of their great optoelectronic properties such as high quantum efficiency and tunable wavelength. However, the instability of cesium lead halide nanocrystals has limited applications. In this work, an approach was adopted towards rapid and stable surface encapsulation of perovskite nanocrystals with polyhedral oligomeric silsesquioxane (POSS) using a module micro-reactor. POSS-CsPbX₃ nanocrystals showing long-time stability were exposed to air and water. The results signified that using this approach presented a novel and promising strategy for green synthesis of POSS-CsPbBr₃, red POSS-CsPbI₃ and blue POSS-CsPbCl₃ nanocomposites, which were more stable than the quantum dot films.