

Fluorescent polymer cubosomes and hexosomes with aggregation-induced emission

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Fluorescent polymer cubosomes and hexosomes with aggregation-induced emission (AIE) were prepared from amphiphilic block copolymers PEG-*b*-PTPEMA where the hydrophobic block PTPEMA was a polymethacrylate with tetraphenylethene (TPE) as AIE side group. A series of highly asymmetric block copolymers with hydrophilic block weight ratio $f_{\text{PEG}} \leq 20\%$ were synthesized. Cubosomes and hexosomes with strong fluorescence emission were obtained by nanoprecipitation of polymers with $f_{\text{PEG}} < 9\%$ in dioxane/water and THF/water systems. Their ordered internal structures were studied by electron microscopy (cryo-EM, SEM and TEM) and X-ray scattering technique (SAXS). To elucidate the formation mechanisms of these inverted colloids, other parameters influencing the morphologies, like the water content during self-assembly and the organic solvent composition, were also investigated. This study not only inspires people to design novel building blocks for the preparation of functional cubosomes and hexosomes, but also present the first AIE fluorescent polymer cubosome and hexosome with potential applications in bio-related fields. [1,2]

[1] H Chen, Y Fan, N Zhang, S Trepout, P Bergam, A Brûlet, BZ Tang, MH Li, *Chemical Science*, 2021, 12, 5495 – 5504. DOI: [10.1039/D1SC00270H](https://doi.org/10.1039/D1SC00270H).

[2] H Chen, MH Li, Recent progress in polymer cubosomes and hexosomes. *Macromol. Rapid Commun.*, 2021, (invited review, to appear).

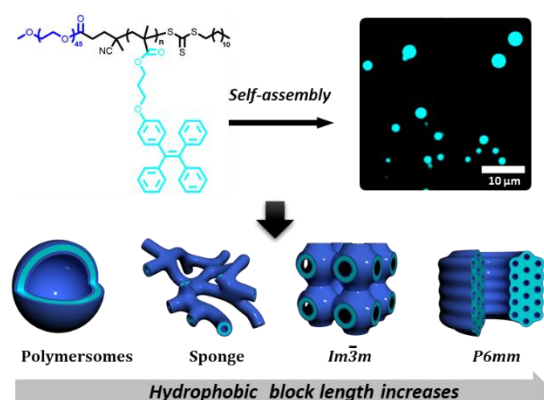


Figure 1 : Fluorescent $Im\bar{3}m$ cubosomes and $P6mm$ hexosomes with aggregation-induced emission (AIE) formed by self-assembling the amphiphilic block copolymers PEG-*b*-PTPEMA in water by nanoprecipitation. The length of the hydrophobic block PTPEMA was adjusted to control colloidal morphologies.