

Luminescent platinum(II) complexes-polymer particles

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We have recently reported luminescent square-planar Platinum(II) complexes with a tunable tendency towards aggregation which was governed by ground-state intermolecular non-covalent interactions^[1]. In these compounds, the establishment of highly directional metallophilic interactions induces dramatic changes in the electronic spectroscopic properties that can be used as fingerprints to follow the self-assembly process. The control of the environment is of critical importance and the interplay between solvents is driven the formation of the aggregates.

In this contribution, we report on the encapsulation of luminescent platinum complexes using poly (methylmethacrylate)-co-poly (methacrylic acid) (PMMA-PMAA). Common morphologies found for those block copolymer are spherical micelles (below 100 nm) and the so-called large compound micelles (LCMs)^[2]. They consist of an aggregation of inverse micelles and their outer surface is stabilized in solution by a thin layer of hydrophilic chains. They have a much larger diameter than spherical micelles and are highly polydisperse.

The resulting water-dispersible polymer particles with entrapped platinum(II) complexes showed dramatic changes in emission wavelength, photoluminescence quantum yield (PLQY) and excited state lifetimes depending on the platinum/polymer ratio in aqueous solution. The size and morphology of these loaded nanoparticles have been studied by scanning electron microscopy (SEM), scanning transmission electron microscopy (STEM) and confocal microscopy (see fig. 1). Assemblies of Platinum(II) complexes within a polymer matrix with tunable photophysical properties are appealing for biological, or sensing applications.

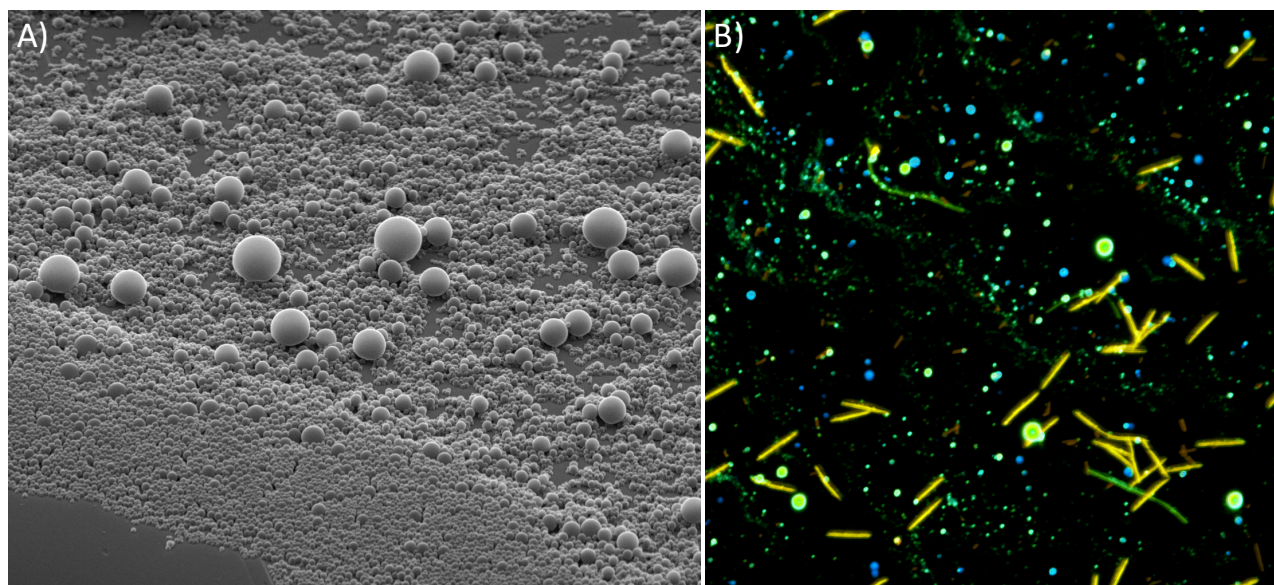


Figure 1. A) SEM picture of the PMMA-PMAA LCMs. B) Confocal image of the free (fibers) and encapsulated (spheres) platinum(II) complex in aqueous solution.

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References:

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