Aggregation behavior of water-soluble distyrylbenzene and distyrylstylbene oligoelectrolytes

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Cationic conjugated oligoelectrolytes based on distyrylbenzene units were synthesized for potential applications in areas such as sensing and optoelectronics. The aggregation behavior of water soluble distyrylbenzene and distyrylstylbene oligoelectrolytes was studied in solution. In aqueous solution, these form worm-like micelles. In addition, they can undergo self-assembly with other amphiphilic molecules, such as surfactants. The effect of size of the hydrophobic chain, the counterion and the nature of the polar group on the photophysical properties of the conjugated oligoelectrolytes under investigation were studied through fluorescence techniques. Changes in the fluorescence quantum yield, vibronic structure and shifts in the maximum emission wavelength were observed. The obtained data suggests the formation of mixed oligoelectrolyte/surfactant micellar complexes in solution, independent of the type of surfactant. Small angle X-ray scattering (SAXS), atomic force microscopy (AFM) and confocal microscopy have been used to provide further insights on the structures of the aggregates formed.

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