Design and synthesis of coil-rod-coil triblock copolymers for interfacial engineering of carbon nanotubes

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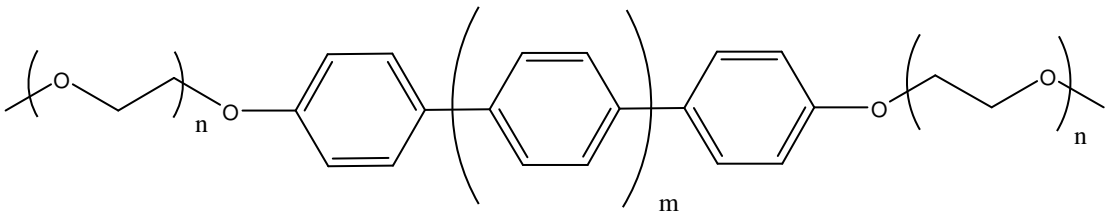
Incorporation of single-walled carbon nanotubes (SWNT) into Molecular electronics and optoelectronics devices seems to be a promising approach. Aiming at dispersing SWNT in organic solvents that solvate electronically functional organic moieties, such as conjugated polymers, we face a challenging task.

Here we describe the design, synthesis and properties of coil-rod-coil triblock copolymers comprises from Polyethylene oxide (PEO) as flexible, hydrophilic moiety and oligo(para)phenylene as rigid, hydrophobic one. The described approach enables fine tuning of the resulted polymers for comprehensive study and various applications.

The concept was demonstrated by the synthesis of a series of tri-block copolymers that vary in the length of their flexible PEO moieties [1]. Systematic investigation of the dispersions suggested that contrary to intuition, the shortest PEO moieties were more efficient. Following this study a series of tri-block copolymers with a longer rigid block was designed. The synthetic approach for the synthesis of this series is presented and discussed.



1) Itzhak, R.; Raichman, D.; Shahar, Z.; Frey, G.L.; Frey, J.; Yerushalmi – Rozen, R. "Tailoring tri-block copolymers for dispersion of individual, pristine, single walled carbon nanotubes in organic solvents" *J.PHYS.CHEM.C.* 2010, *114,* 3748–3753.