

Supporting Information for

On Modulating the Self-Assembly Behaviors of Poly(styrene-*b*-4-vinylpyridine)/Octyl Gallate Blends in Solution State via Hydrogen Bonding from Different Common Solvents

Shih-Chien Chen^a, Shiao-Wei Kuo^b, and Feng-Chih Chang^{a*}

^aInstitute of Applied Chemistry, National Chiao Tung University, Hsin Chu, 300 Taiwan.

^bDepartment of Materials and Optoelectronic Science, Center for Nanoscience and Nanotechnology,
National Sun Yat-Sen University, Kaohsiung, 804, Taiwan.

*To whom correspondence should be addressed

E-mail: changfc@mail.nctu.edu.tw

TEL: 886-3-5131512

FAX: 886-3-5131512

Experimental Section

Block Copolymer Synthesis

Poly(styrene-*b*-4-vinyl pyridine) (PS-*b*-P4VP) diblock copolymer was synthesized by sequential anionic polymerization of styrene and 4-vinyl pyridine in tetrahydrofuran (THF) with *sec*-butyllithium as initiator. Lithium chloride (LiCl) was used to prevent side reaction and reduce the reactivity of the chain ends from 4-vinyl pyridine polymerization. Polymerizations were carried out under an inert atmosphere in a round-bottomed flask equipped with a rubber septum. Solvents, initiators, and monomers were transferred via a stainless capillary and syringe to the reactor. *sec*-Butyllithium was first added into the glass reactor containing the LiCl (was in 5-fold excess relative to the *sec*-butyllithium) in THF; a dark red color appeared. After the temperature was decreased to -78 °C, the styrene was added, and an aliquot of the polystyrene sample was isolated for analysis after termination with degassed methanol. A second block was created by slowly adding the 4-vinylpyridine, again maintaining similar reactor temperature. The polymerization was also terminated by degassed methanol. The resulting polymer underwent two dissolve (DMF)/precipitate (water) cycles and purified by the Soxhlet extraction with water for 72 h before being dried under vacuum at 85 °C. Finally, the poly(styrene-*b*-4-vinyl pyridine) (PS-*b*-P4VP) diblock copolymer was obtained.