Electronic Supplementary Information (ESI)

RAFT copolymerization of phosphorus-containing monomer with α-hydroxy phosphonate and methyl methacrylate

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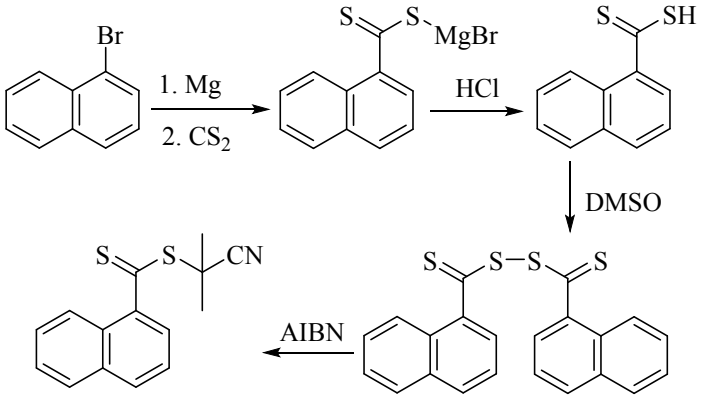
Synthesis of 2-cyanoprop-2-yl dithionaphthalenoate(CPDN)

As shown in Scheme 2, CPDN was prepared according to the method.[1] A solution including 22.5 g of (0.11 mol) 1-bromonaphthalene and 90 mL of THF was added to a 250 mL bottle containing magnesium (2.88 g, 0.118 mol) within 1 h and refluxed for 1 h. Carbon disulfide (8.36 g, 0.11 mol) was added to the solution at room temperature and refluxed for 8 h. The mixture was poured into water and acidified by diluted hydrochloric acid. The solution was extracted with chloroform (40 mL × 3). After evaporation under vacuum, the residue was mixed with 18 mL of ethyl acetate and reacted with 4.70 g of DMSO under nitrogen protection for 10 h. The mixture was added with 12.24 g of AIBN and refluxed for another 15 h. After evaporation of the solvent, crude CPDN was obtained. The pure CPDN was obtained as a solid by chromatography on silica gel column with petroleum ester: ethyl acetate = 10:1 as eluant as a dark red

oil (10.5 g, 32.7%) and then kept in the refrigerator at −18 °C. HPLC (Waters 515) indicated that the purity is above 95%. ^{1}H NMR ($CDCl_3$, 300 MHz): δ = 1.95 (s, 6H); 7.42 (m, 2H); 7.51 (m, 2H); 7.85 (m, 2H) and 8.10 (m, 1H).



Scheme 2. Synthetic pathway of CPDN.

1. J. Zhu, X. L. Zhu, Z. P. Cheng, F. Liu and J. M. Lu, *Polymer*, **2002**, 43, 7037.