

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
12 October 2006 (12.10.2006)

PCT

(10) International Publication Number
WO 2006/107740 A3

(51) International Patent Classification:
C08G 18/64 (2006.01)

(21) International Application Number:
PCT/US2006/011840

(22) International Filing Date: 31 March 2006 (31.03.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/667,065 1 April 2005 (01.04.2005) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
6 December 2007

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: LIVING SYNTHESIS OF CONDUCTING POLYMERS INCLUDING REGIOREGULAR POLYMERS, POLYTHIOPHENES, AND BLOCK COPOLYMERS

(57) Abstract: Regioregular poly(3-alkylthiophenes) and other polythiophenes can be prepared by living polymerization which have good solubility, processability and environmental stability. The polymerization method can afford regioregular poly(3-alkylthiophenes) in high yields. Kinetic study of polymerization revealed the living character of this process. The molecular weight of poly(3-alkylthiophenes) is a function of the molar ratio of the monomer to nickel initiator, and conducting polymers with relatively narrow molecular weight distribution (PDK1.5) are now readily available. Sequential monomer addition resulted in new block copolymers containing different poly(3-alkylthiophene) segments, which further confirms the "livingness" of this system. Other synthetic methods can be used as well to conduct living polymerization. Blends and electronic devices can be prepared.



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