

Synthesis and Characterization of Pentacenes with Flexible Side Groups

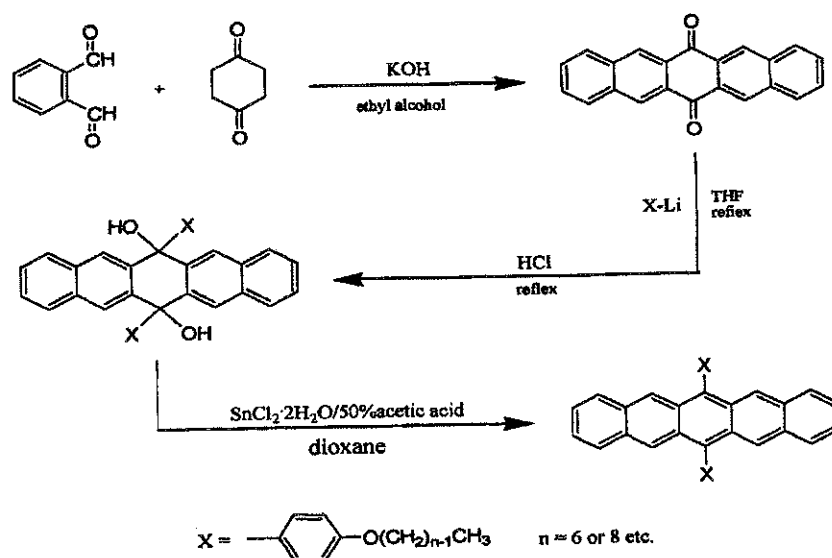
Min-Hyo Kang¹, E-Joon Choi^{1}, and Jae-Hoon Kim²*

¹Department of Polymer Science and Engineering, Kumoh National Institute of Technology, Gumi, Korea

²Division of Electrical and Computer Engineering, Hanyang University, Seoul, Korea

ejchoi@kumoh.ac.kr

During the last few years, the development of organic thin film transistors (OTFTs) has attracted much interest. The production of OTFTs has been studied because organic molecules offer the opportunity of deposition over large surface areas and are compatible with flexible plastic substrates. Although organic materials have the key advantage of potentially simple and low temperature thin film processing, using techniques such as spin coating, stamping or ink-jet printing methods. Thin film field-effect transistors using pentacene as the active semi-conductor have shown charge transport mobility in the range of $0.005\text{--}2.1\text{ cm}^2\text{V}^{-1}\text{s}^{-1}$ and on/off current ratios larger than 10^8 . But, pentacene practically used in OTFTs gives rise to problems mainly due to its very low solubility. To make up for those problems, in this study we have synthesized and characterized new pentacene derivatives with flexible side groups.



Scheme 1. Synthetic route to soluble pentacenes.

References

1. N. Vets, M. Smet, and W. Dehaen, *Tetr. Lett.*, **45**, 7287, (2004).
2. J. Puigdollers, C. Voz, A. Orpella, R. Quidant, and I. Martin, *Org. Electron.*, **5**, 67, (2004).
3. E. J. Hwang, Y. E. Kim, C. J. Lee, and J. W. Park, *Thin solid films*, **499**, 185, (2006).
4. J. Jiang, B. R. Kaafarani, and D. C. Neckers, *J. Org. Chem.*, **71**, 2155, (2006)

Since 1989

**KOREA-JAPAN
JOINT FORUM
2006**

**Organic Materials
for Electronics and Photonics**

October 2-5, 2006

**Toki Messe
Niigata, Japan**

<http://kjf2006.eng.niigata-u.ac.jp/>

- P-150 Synthesis and Characterization of Electronic Ink Particles for Electronic Paper by Using Polymerization Method
Hyo Sim Kang, Sun Wha Oh, Mi Na Park, Ju Chang Kim, Young Soo Kang (Pukyong Natl. Univ.)
- P-151 Synthesis of C₆₀ Polymer by Free Electron Laser Irradiation with Tunable Wavelength
Shingo Ando, Ryo Nokariya, Reou Koyaizu, Nobuyuki Iwata, and Hiroshi Yamamoto (Nihon Univ.)
- P-152 Synthesis and Characterization of New Main-Chain Polymers Containing Bent-Core Mesogen with Sharp Bend Angle and Lateral Substituent
Eun Chul Kim¹, E-Joon Choi¹, and Wang-Choel Zin² (Kumoh Natl. Inst. of Tech.¹, Pohang Univ. of Sci. and Tech.²)
- P-153 Synthesis and Mesogenic Properties of Pinwheel-Shaped Molecules with 1,3,4-Oxadiazoles
Eun-Kyung Kwon¹, E-Joon Choi¹, and Edward T. Samulski² (Kumoh Natl. Inst. of Tech.¹, Univ. of North Carolina²)
- P-154 Synthesis and properties of novel photosensitive copolymers having photoreactive pendant group
Heon Seung Chae¹, Yun Heum Park^{1,2} (Sungkyunkwan Univ.¹, Hyperstructured Organic Materials Research Center²)
- P-155 Synthesis and Characterization of Pentacenes with Flexible Side Groups
Min-Hyo Kang¹, E-Joon Choi¹, and Jae-Hoon Kim² (Kumoh Natl. Inst. of Tech.¹, Hanyang Univ.²)
- P-156 Synthesis and Characterization of Fluorene-Based Conjugated polymers containing Rgioregular Hexyl-Thiophene derivatives in the main chain
HoYoul Kong, Eunhee Lim, Jonghee Lee, Hong-Ku Shim (KAIST)
- P-157 Synthesis and Evaluation of Novel Photoacid Generator for Lithography
Eujean Jang, Gijin Kwun, Hyun Jin Yoon, Suk Hoon Ahn, Haiwon Lee (Hanyang Univ.)
- P-158 Synthesis and Electrochemical Properties of Poly[N-(6-azidoheptyl)-ethynylpyridinium tetraphenylborate]
Yeong-Soon Gal¹, Sung-Ho Jin², Won-Chul Lee¹, Jae-Wook Lee³, Sung-Hoon Kim⁴, Jong-Wook Park⁵, Sang Youl Kim⁶ (Kyungil Univ.¹, Pusan Natl. Univ.², Dong-A Univ.³, Kyungpook Natl. Univ.⁴, The Catholic Univ.⁵, KAIST⁶)
- P-160 Spectroelectrochemical properties of s-triazine containing oligo (p-phenylene vinylene)s
Bhimrao D. Sarwade, Taechang Kwon and Eunkyong Kim (Yonsei Univ.)
- P-161 Electrochemical properties of PEDOT fiber non-woven web prepared by electrospinning
Hoang Dung Nguven, Jung Min Ko, Young Rock Kwon, Jun Young Lee (Sungkyunkwan Univ.)
- P-162 Electrochemical performance of anode supported SOFC single cells with anode/electrolyte and cathode electrolyte interlayers
Haekwang Yang, Taewook Eom, Jeehyun Moon, Sang Joon Park (Kyungwon Univ.)
- P-163 Styrene-modified TiO₂ nanoparticles with improved suspension stability for electrophoretic display
Seok Ki Kim¹, Young Rok Kwon¹, Seung Hyun Cho¹, Jun Young Lee¹ (Sungkyunkwan Univ.)
- P-164 Conducting polymer electrochemical actuator made of high strength composites films of PEDOT /NBR/ionic liquid
Hyunjoon Seo, Mi Suk Cho, Jaedo Nam Yongkeun Son, and Youngkwan Lee (Sungkyunkwan Univ.)
- P-165 The Electronic Structures of Permethyl Oligogermane radical cation with longer chains
Hiroshi Kawabata¹, Shigekazu Ohmori¹, Kazumi Matsushige¹, Hiroto Tachikawa² (Kyoto Univ.¹, Hokkaido Univ.²)
- P-166 Direct ab-initio MD study on the Diffusion of lithium and sodium ion on amorphous carbon
Tetsuji Iyama¹, Hiroshi Kawabata² and Hiroto Tachikawa¹ (Hokkaido Univ.¹, Kyoto Univ.²)
- P-167 Molecular design of high performance molecular devices based on direct ab-initio MD method
Hiroto Tachikawa¹, Tetsuji Iyama¹, and Hiroshi Kawabata² (Hokkaido Univ.¹, Kyoto Univ.²)