2016 STAM Best Paper Award

Recent Progress of High Performance Polymer OLED and OPV Materials for Organic Printed Electronics

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Chizu Sekine
Advanced Material Development Laboratory
Sumitomo Chemical Co., Ltd.
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STAM Editorial Board
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Chizu Sekine, Yoshiaki Tsubata, Takeshi Yamada, Makoto Kitano and Shuji Doi

Yoshiaki Tsubata
Advanced Material Development Laboratory
Sumitomo Chemical Co., Ltd.

Takeshi Yamada
Advanced Material Development Laboratory
Sumitomo Chemical Co., Ltd.

Makoto Kitano
International Association for the Protection of Intellectual Property of Japan

Shuji Doi
Research Planning & Coordination Dept.
Sumitomo Chemical Co., Ltd.
R&D on Printed Electronics Materials

of Sumitomo Chemical

Polymer Technology

Conductive Conjugated Polymers 1981~1991

Semi-Conductive Conjugated Polymers 1991~

Oriented PPV: $10^4$ S cm$^{-1}$

Polymer OLED

Organic transistor

Organic Photovoltaic

Materials

Emitter

Semiconductor

Photoelectric Converter

Devices

Structure, Electrode, Encapsulation

Printing

Inkjet, Coating, R to R
$\eta_{ext} = \gamma \times \eta_{eh} \times \Phi_{ph} \times K_{oc}$

**Loss of Carrier Balance**
- $\gamma$: Charge Balance
- $\eta_{eh}$: Exciton formation ratio

**Decay of Photo Luminescence**
- $\Phi_{ph}$: PLQE

- Decay of photoluminescence caused by quenching site generation is main factor of lifetime.
- Decay of PL is NOT caused by charge carrier only, BUT caused by exciton formation.

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Figure 6. Degradation curves of EL and PL peak intensities of EL device containing a blue polymer during constant-current operation. Device structure: ITO/ HIL/ IL(20 nm)/ LEP(60 nm)/ cathode.

Innovative Trends of PE

Japan Advanced Printed Electronics Technology Research Association

“Basic Process Technology for Customization”
“Flexible Multi-functional Device Technology”

Organic and Printed Electronics Association

Hybrid Electronic Systems
;combining printed and flexible electronics with classical silicon components which enables a bigger range of new applications. (http://www.oe-a.org/workinggroups)

FlexTech Alliance Receives $75M Department of Defense Award To Create and Manage a Flexible Hybrid Electronics Manufacturing Facility. (Aug. 28, 2015) (https://flextech.org/)