

(19) (KR)
(12) (B1)

(51) 。 Int. Cl.⁷
C09K 11/06

(45)
(11)
(24)

2004 10 06
10-0451440
2004 09 22

(21) 10-2002-0022881
(22) 2002 04 26

(65)
(43)

10-2003-0084260
2003 11 01

(73)

31

(72)

740-13 403

403-64

101-707

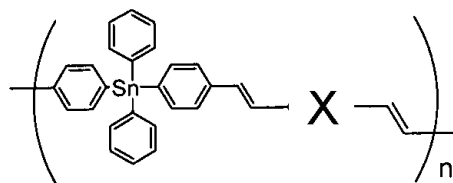
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756 6-601

(74)

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(54)



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，n

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1 UV-가
 2 (PL)
 3 가
 4 5 4 6 가
 6 4 7 가
 7
 8 4 7
 9 4 7 C.I.E. 1931

, π - (electroluminescent; EL)
 small molecule - based) EL 가
 π - EL $\pi - \pi^*$
 EL R/G/B , 가
 , , 가
 , , LED
 4가 가 가 (p-), (p-)
), (p-) (LPPP) LED 가 , $\pi - \pi$ (EL)
 / 가 , PPV - () m -
 , π - (chromophore)
 π - (stiffness)
 s) , , 가

[Kim, H. K. et al., *Macromolecules* 30, 1236(1997), Kim, H. K. et al., *Macromolecules* 31, 1114 (1998), Kim, K. D. et al., *Macromolecules* 31, 7267 (1998), Jung, S. H. et al., *Macromolecules* 33, 9277 (2000), Baek, N. S. et al., *Synth. Met.* 121, 1743 (2001)].

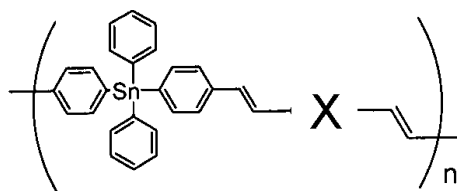
, 가 , (EL)
 EL d- LUMO 10 V
 ,
 EL [Paik, K. L. et al., *ACS Polymer Preprints* 43(1),

77 (2002)].

, 가 EL .

, 가 (organotin) π -
1 .

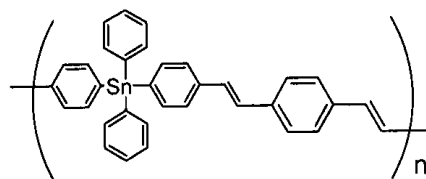
1



, X

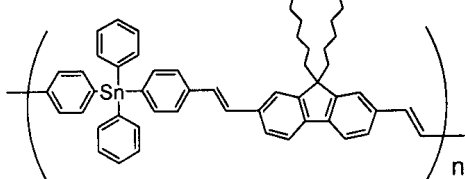
, 2 , n 가 .

2



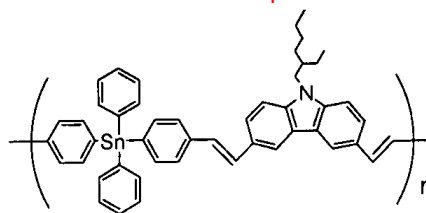
, 3 가 .

3



, 4 가 .

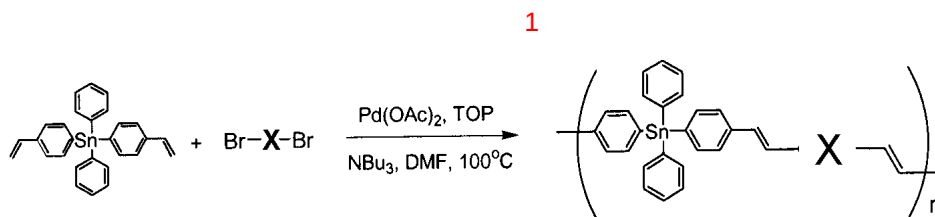
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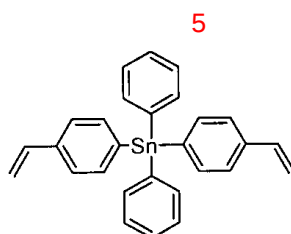
5×10^{-3}

가 , 1×10^{-3} -

EL 1 Heck (Heck reaction)

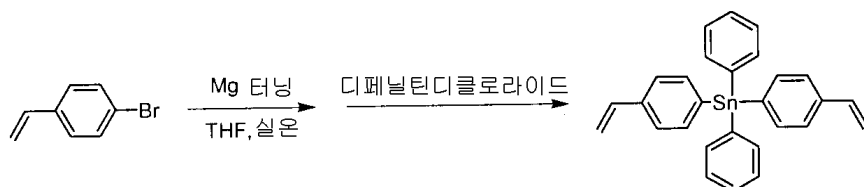


(2- , X) 1 , Pd(OA_C)₂ (II) [palladium(II)acetate], TOP
[tris(2-methylphenyl) phosphine], NBU₃ (tributylamine), DMF N,N-
(N,N-dimethylformamide) 5 Br-X-Br (X
) Heck



(rigid) π - , Sn-C 가 (δ_{Sn-C} = 21
7 pm) Sn-C
UV-가 350 394 nm

1: (distyryldiphenylstannane: 5)
THF(20 ml) 4- (500μl, 1.9 mmol) (92.4 mg, 3.8 mmol)
가 30 THF (10 ml) (326.6 mg, 0.95 mmol) 가
5
(15:1)) (159 mg, 35%, 95-96).



¹ H-NMR(300 MHz, CDCl₃): δ 5.25(d, 2H, J=10.9 Hz), 5.77(d, 2H, J=17.6 Hz), 6.70(dd, 2H, J=17.6 Hz and 10.9 Hz), 7.24-7.46 (m, 10H), 7.54-7.60 (m, 8H)

¹³ C-NMR (75 MHz, CDCl₃): δ 138.5, 138.0, 137.6, 137.4, 137.0, 129.4, 128.9, 126.5, 114.7

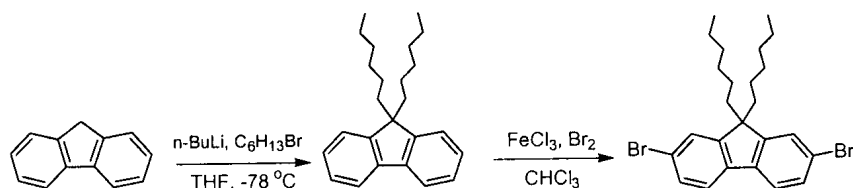
FT-IR (NaCl, cm⁻¹): 3060, 2987, 2958, 1628, 1588, 1492, 1429, 1300, 1260, 1185, 1159, 1013, 995, 913

HRMS(M⁺) C₂₈H₂₄Sn : 480.0900, :480.0906

C₂₈H₂₄Sn : C 70.18, H 5.05, : C 69.90, H 5.32

2: 2,7- 9,9'- (7)
9,9- (15 g, 44.84 mmol) 0 120 ml (11
2 mg, 0.688 mmol) (4.83 ml, 93.98 mmol) 가
3

(, :) ,



$^1\text{H-NMR}$ (300 MHz, CDCl_3): δ 0.58(m, 4H), 0.82-1.25(m, 18H), 1.90 (m, 4H), 7.44 (d, 2H), 7.46 (d, 2H), 7.53 (d, 2H).

3: 3,6- (2-) (6)

mg, 7.38 mmol)

가 (150 ml)

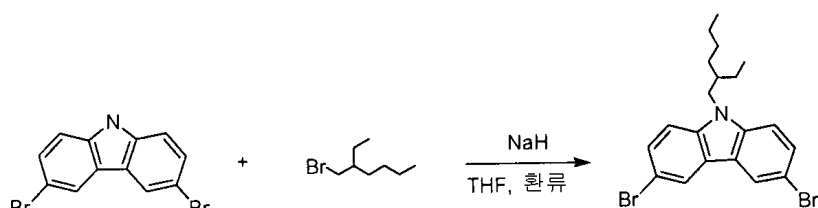
2
가

110

60

(2 g, 6.15 mmol), THF (30 ml) NaH (177 (1.78 g, 9.22 mmol)

(, : / (3:1)) ,



$^1\text{H-NMR}$ (300 MHz, CDCl_3): δ 0.82-0.89 (m, 6H), 1.21-1.31 (m, 8H), 2.02(m, 1H), 4.07 (d, 2H), 7.2-8.1 (m, 6H)

$^{13}\text{C-NMR}$ (75 MHz, CDCl_3): δ 139.53, 128.79, 123.21, 123.03, 111.78, 110.52, 47.59, 39.32, 30.96, 28.78 , 24.37, 23.06, 14.10, 10.95

1: SnPhPPV(2)

1

1,4-

1,4- (o-)

(246 mg, 1.04 mmol)

10 ml DMF

$\text{Pd}(\text{OAc})_2$ (24 mg, 0.11 mmol)

(95 mg, 0.313 mmol)

50

(0.5 g, 1.04 mmol)

(2.36 ml, 12.52 011mmol)

가

100

24

(0.45 μm)

1

50

2: SnPhFPV(3)

1,4-

2

1

3: SnPhPVK(4)

1,4-

3

1

1-3

1

[1]

	Mn ($\times 10^3$)	Tg ()	T_{ID}^1 ()	UV (λ_{max}) (nm)		PL (λ_{max}) (nm)	
				2	3	2	3
1	2.3	-	-	347	-	442	-
2	4.6	-	300	394	398	456	470
3	2.5	81	314	355	374	453	470
1: 2: CHCl_3 1 10^{-4} 3:							

1 3 FR-IR, ^1H -NMR, ^{13}C -NMR UV-가
 FT-IR (C=C) 1600 cm^{-1}
 960 cm^{-1} 가
 ^1H -NMR 가 5.2-5.7 ppm 가
 7.0-7.5 ppm 가 0.2-2.0 ppm 4.1 ppm
 α - 가
 $2.5 \times 10^3 - 4.6 \times 10^3$ (Mn) (GPC)
 (1) THF, CHCl_3 , CH_2Cl_2 , DMF
 1 1 3 UV-가 1
 (π -) 350-394 nm SnPhFPV SnPhPVK
 2 350 nm (PL) 470 502 nm
 2 3 DSC TGA X-
 T_g 81 300 314 (1%)
) (3)
 4:
 ITO/PEDOT (50nm)/ (80nm)/Ca (50nm)/Al (200nm) PED
 OT (Polyethylenedioxythiophene) (HTL) 2 Sh
 PhFPV HTL 80nm
 50 nm 200 nm
 5:
 3 ShPhPVK 4
 6:
 ShPhFPV:PVK[(9-)] 8: 2 4
 7:
 ShPhPVK:PVK 8: 2 4
 4 7 가 2

[2]

	EL(λ_{max}) (nm)	(cd/m 2)	(V)	(mA/cm 2)	(cd/A)	(lm/W)	CIE	
							x	y
4	470	238	5.5	386	0.062	0.035	0.166	0.289
5	472	222	9	1087	0.020	0.007	0.200	0.306
6	464	242	7	96	0.252	0.113	0.153	0.218
7	470	242	10.5	259	0.094	0.028	0.169	0.286

4 6 가 4 5
 4 5 , 4 6 470 nm 464 nm
 , EL 가 가 가
 6 4 7 가 4
 7 4V
 가 , ShPhFPV ShPhPVK (LUMO)
 (HOMO) (cyclic voltammetry) 가 7
 SnPhFPV SnPhPVK LUMO 3.21 eV 2.93 eV

, (HOMO) 5.89 eV 5.64 eV . PPP, PPP PAF (p-)) LUMO LED 가 (p-) (p-) . 8 4 7 6 7 2-4 3-6 (2). 4 5 , 9 4 7 0.1-0.3 lm/W가 C.I.E. 1931 . 9 PVK 6 11V 가 2047 cd/ m² 0.3 cd/A . , EL

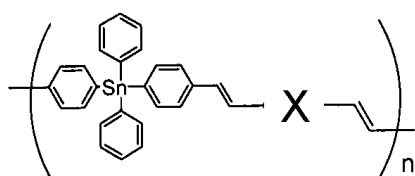
, 4V 가 가 , 가 .

(57)

1.

1 1

:



, X

,

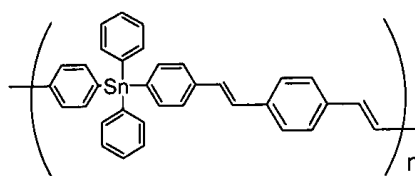
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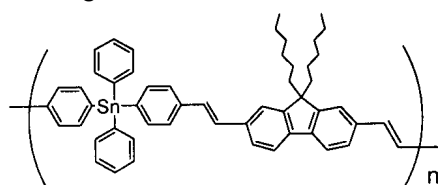


3.

1 1 3

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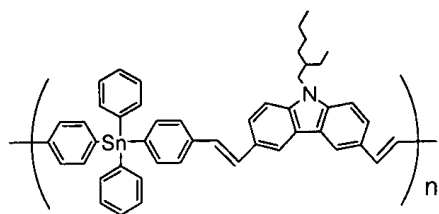


4.

1 1 4

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5.

1 4 , .

6.

1 4 , .

7.

1 4 , .

 $1 \times 10^{-3} - 5 \times 10^{-3}$

8.

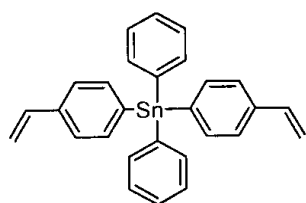
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Br-X-Br (X

1

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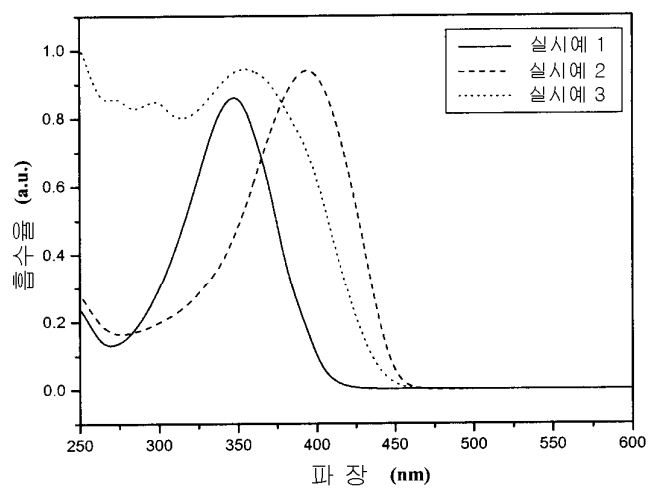
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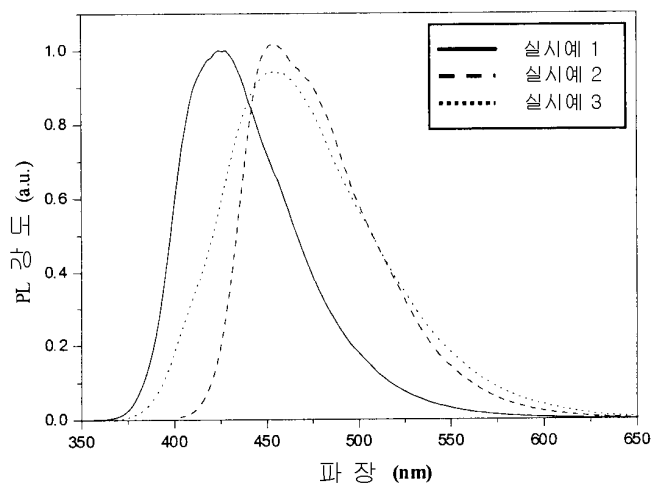
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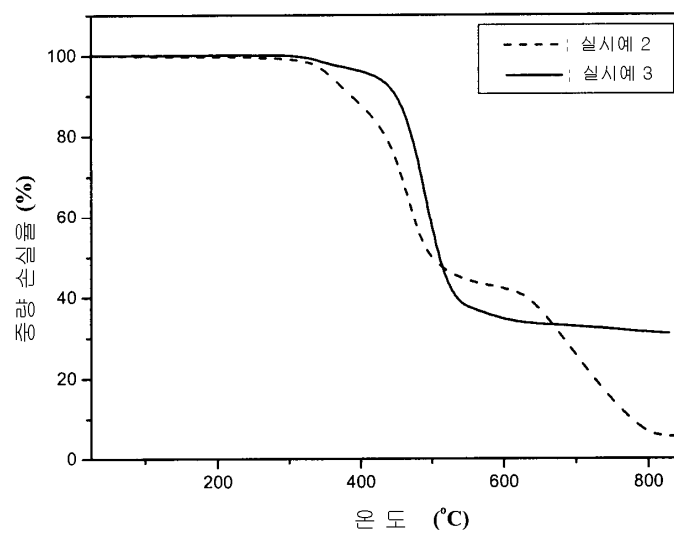
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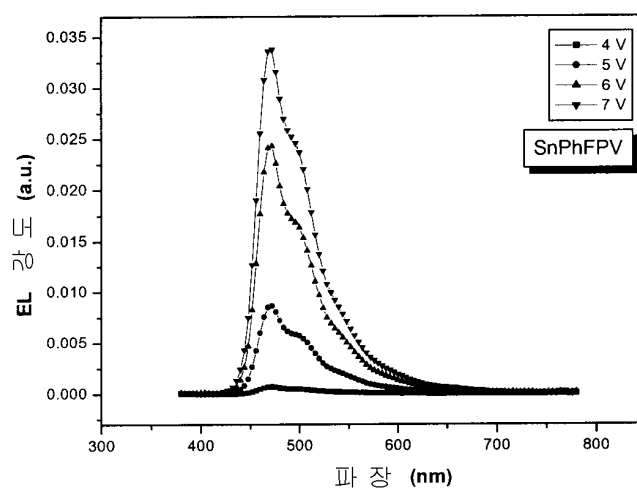
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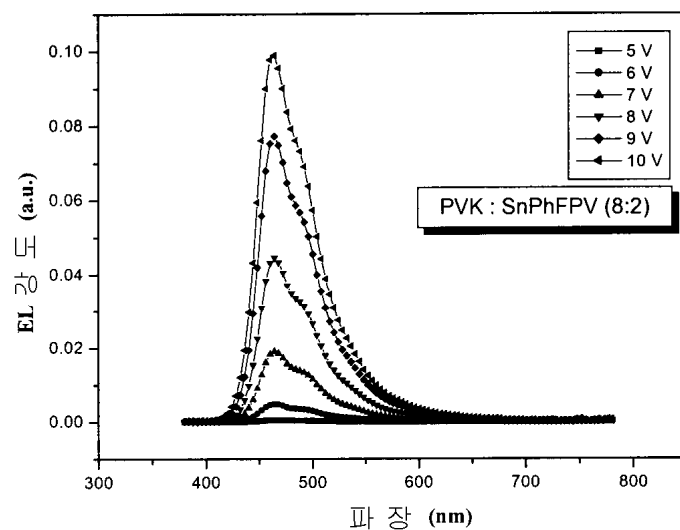
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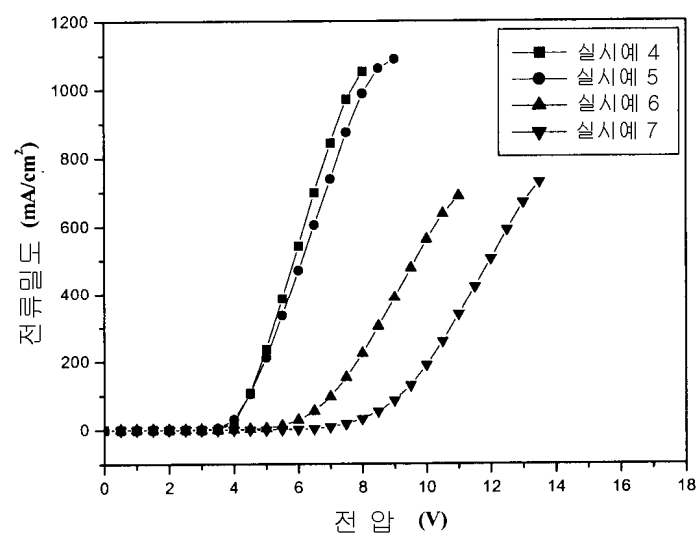
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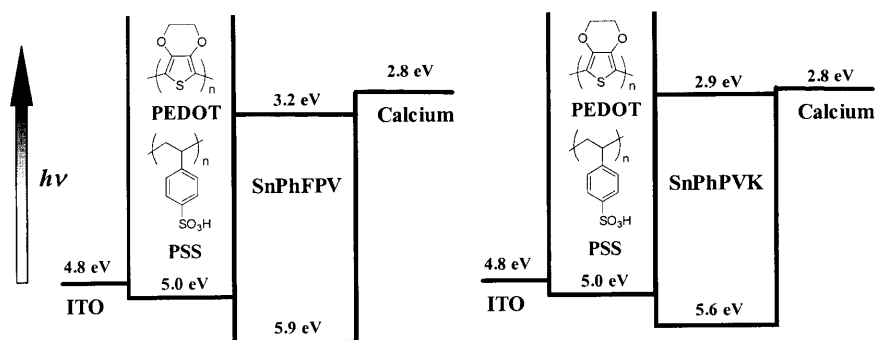
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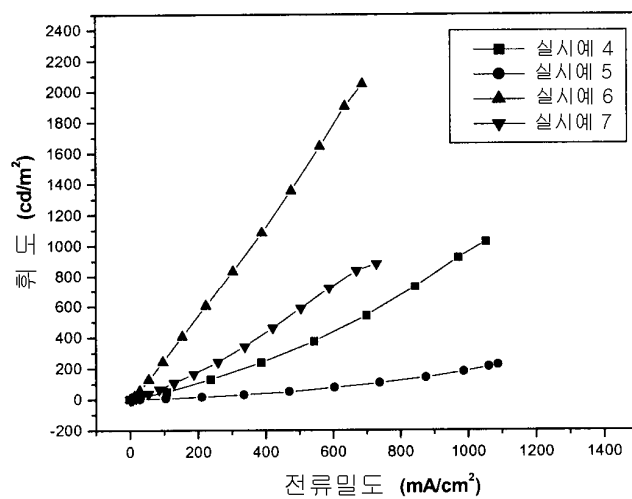
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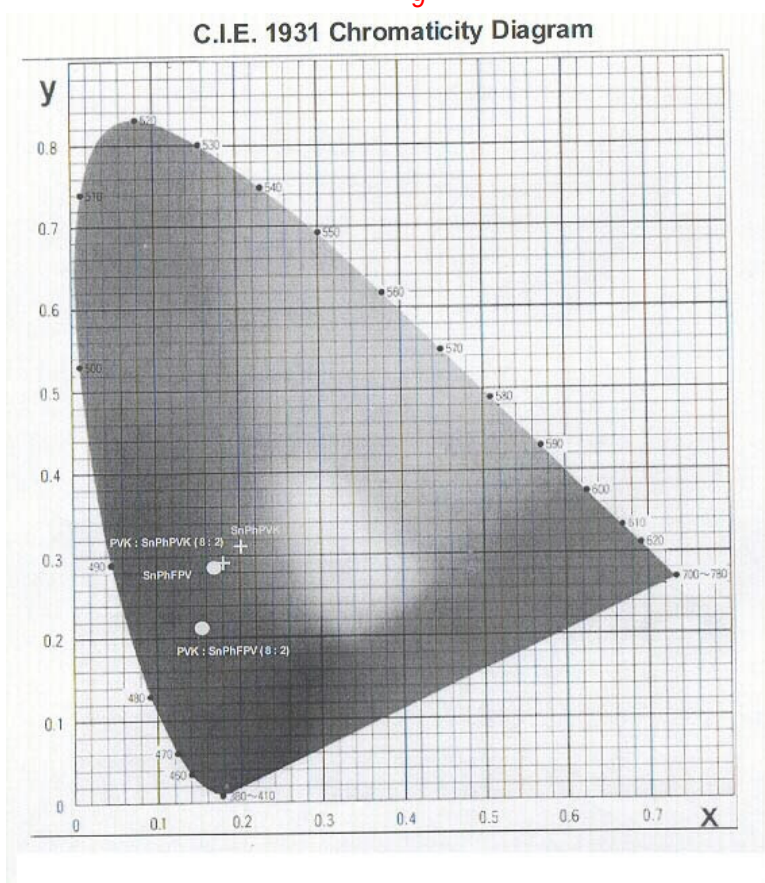
7



8



9



专利名称(译)	锡基电致发光聚合物		
公开(公告)号	KR100451440B1	公开(公告)日	2004-10-06
申请号	KR1020020022881	申请日	2002-04-26
[标]申请(专利权)人(译)	浦项工科大学校产学协力团 学校法人浦项工科大学		
申请(专利权)人(译)	学校法人浦项工科大学		
当前申请(专利权)人(译)	学校法人浦项工科大学		
[标]发明人	BAEK NAMSEOB 백남섭 KIM HWANKYU 김환규 LEE JI HOON 이지훈 CHAE EUNHEE 채은희 KIM BYEANGHYEAN 김병현		
发明人	백남섭 김환규 이지훈 채은희 김병현		
IPC分类号	C09K11/06		
CPC分类号	C09K11/06 C09K2211/1425 C09K2211/1433 H01L51/0035 H01L51/0039 H01L51/0043 H01L51/50 H05B33/14 Y10S428/917		
代理人(译)	哦，奎焕 张居正，KU SEONG		
其他公开文献	KR1020030084260A		
外部链接	Espacenet		

摘要(译)

本发明涉及有用的锡基电致发光聚合物作为蓝色发光材料。并且聚合物具有下列化学式的重复单元：等式中的x是取代或非取代的亚苯基，并且n是苄烯或唑基是正整数。

