표 1. Organic Photovoltaic Cell (Blend Type)

Device structure	η_e (*1) (%)	η_c (*2) (%)	I_{sc} (*3) (/cm^2)	V_{oc} (*4)	FF (*5)	P_{in} (/cm^2) (*6)	References
ITO/MEH-PPV+CN-PPV(14:1)/Ca	0.9	5	80 μA	1.25 V	-	20 mW (430 nm)	G.Yu et al, *J. Appl. Phys.*, **78**, 4510 (1995).
ITO/MEH-PPV+[6,6]PCBM (1:4)/Ca	1.6	29	2 mA	0.8 V	0.33	20 mW (430 nm)	G.Yu et al, *Science*, **270**, 1789 (1995).
ITO/MEH-PPV+CN-PPV/Al	-	6	2~3 μA	0.6 V	~0.3	0.15 mW (550 nm)	J. J. M. Halls et al, *Nature.*, **376**, 498 (1995).
ITO/MEH-PPV+C_{60}(1:3)/Al	2.5	26	1.8 mA	0.43V	0.65 (*7)	20 mW (430 nm)	J. Gao et al, *Synth. Met.*, **84**, 979 (1997).
ITO/MEH-PPV+CN-PPV(5:1)+PEO: $LiCF_3SO_3$electrolyte/Al	0.1	1.5	83 μA	1.0 V	0.25	20 mW (430 nm)	J. Gao et al, *Adv. Mater.*, **10**, 692 (1998).
PE/ITO/MDMO-PPV+PCBM(1:3)/Al	1.2	16.5	0.65 mA	0.53 V	0.35	10 mW (488 nm)	C. J. Brabec et al, *Synth. Met.*, **102**, 861(1999).
ITO/MEH-OPV5+C_{60}/Al							
1) co-deposition	-	26	0.1 mA	0.46V	-	1 mW	L. Ouali et al,
2) consecutive deposition	-	26	0.1 mA	0.65V	-	(485 nm)	*Adv. Mater.*, **11**, 1515 (1998).
MWNT/PPV/Al	0.081	3.9	0.56 μA	0.9 V	0.23	37 μW	H. Ago et al,
(Muti Wall Carbon Nano Tube)						(485 nm)	*Adv. Mater.*, **11**, 1281 (1999).
ITO/PEDOT:PSS/MDMO-PPV+PCBM (1:4)/LiF/Al	2.5	-	5.25 mA	0.82 V	0.61	80 mW (AM 1.5) *8	S. E. Shaheen et al, *Appl. Phys. Lett.*, **78**, 841 (2001).
ITO/HBC-PhC_{12}+Perylene (2:3)/Al	1.95	18	33.5 μA	0.69 V	0.4	0.47 mW (490nm)	L. Schmidt-Mende et al, *Science*, **293**, 1119 (2001).
ITO/PEDOT:PSS/PTPTB+PCBM (1:1)/Al	0.34	-	0.8 mA	0.67 V	0.35	55 mW (White Light)	A. Dhanabalan et al, *Adv. Funct. Mater.*, **11**, 255 (2001).
ITO/PEDOT:PSS/MDMO-PPV+PCBM (1:4)/Al	4.3	29.7	3.16 mA	0.84 V	0.44	27 mW (488 nm)	S. E. Shaheen et al, *Appl. Phys. Lett.*, **79**, 2996 (2001).
ITO/P3OT+SWNT(1%)/Al (Single Wall Carbon Nano Tube)	0.04	-	0.12 mA	0.75 V	0.3~0.4	100mW (AM 1.5)	E. Kymakis et al, *Appl. Phys. Lett.*, **80**, 112 (2002).
ITO/PEDOT:PSS/MDMO-PPV+PCBM (1:4)/LiF(3Å)/Al	3.3	-	5.25 mA	0.82 V	0.61	80mW (White Light)	C. J. Brabec et al, *Appl. Phys. Lett.*, **80**, 1288 (2002).
ITO/PEDOT:PSS/P3HT+CdSe nano-rod(90%)/Al							
1) momochromatic light	6.9	54.5	0.019 mA	0.5 V	0.6	0.084 mW (515 nm)	W. U. Huynh et al, *Science*, **295**, 2425 (2002).
2) AM 1.5 Global	1.7	-	5.7 mA	0.7 V	0.4	AM 1.5 Global	
ITO/PEDOT:PSS/PTPTB+PCBM(1:3)/ LiF/Al	1.0	-	3.1 mA	0.72 V	0.37	80 mW (AM 1.5)	C. J. Brabec et al, *Adv. Funct. Mater.*, **12**, 709 (2002).
ITO/PEDOT:PSS/P3HT+PCBM(1:3)/ Ca/Ag	2.8	-	8.7 mA	0.58 V	0.55	100 mW (AM 1.5)	P. Schilinsky et al, *Appl. Phys. Lett*, **81**, 3885 (2002).

표 2. Organic Photovoltaic Cell (Bilayer Type)

Device structure	η_e (%)	η_c (%)	I_{sc} (/cm^2)	V_{oc}	FF	P_{in} (/cm^2)	References
ITO/MEH-PPV/C_{60}/Al	0.04	0.5	2.08 μA	0.53 V	0.48 (*7)	1 mW (514.5 nm)	N. S. Sariciftci et al, *Appl. Phys. Lett.*, **62**, 585 (1993).
ITO/PPV/C_{60}/Al	0.55	9	3.6 μA	0.8 V	0.48	0.25 mW (490 nm)	J. J. M. Halls et al, *Appl. Phys. Lett.*, **68**, 3120 (1996).
Au/PEDOT:PSS/POPT+ MEH-CN-PPV (19:1)/MEH-CN-PPV+ POPT(19:1)/Ca							M. Granström et al, *Nature*, **395**, 257 (1998).
1) Momochromatic	4.8	30.4	4 μA	1.3 V	0.3~0.35	34 μW (480 nm)	
2) AM 1.5	1.9	-	-	-	-	77 mW (AM 1.5)	
F-doped SnO_2/TiO_2/Ru(II)L_2(SCN)$_2$/OMeTAD/Au	0.74	-	0.32 mA	0.34 V	0.62	9.4 mW (AM 1.5)	U. Bach et al, *Nature*, **395**, 583 (1998)
ITO/MDMO-PPV+ PCBM/C_{60}-ZnPC/Al	0.5		1.01 mA	0.6 V	0.5~0.57	AM 1.5	P. Peumans et al, *Appl. Phys. Lett.*, **76**, 2650 (2000).
ITO/PEDOT:PSS/MDMO-PPV/PCBM + POPT(1:0.2)/Al	0.5	-	0.96 mA	0.78 V	0.5	78 mW (AM 1.5)	L. Chen et al, *Adv. Mater.*, **12**, 1367 (2000).
ITO/TiO_2/MEH-PPV/Au	0.18	-	0.4 mA	1.1 V	0.42	100 mW (White Light)	A. J. Breeze et al, *Phys. Rev. B.*, **64**, 125205 (2001).
1) ITO/CuPC/C_{60}/Al	0.18	-	0.2 mA	~0.4 V	0.4	18 mW	T.Stübinger et al,
2) ITO/PPV/C_{60}/Al	0.56	-	0.24 mA	~0.85 V	0.49	(White Light)	*J. Appl. Phys.*, **90**, 3632 (2001).
Organic-Inorganic hybride Solar Cell							
1) n-GaAs/4T/Au (4T : quaterthiophene)	1.6	-	-	~0.35 V	>0.6	40 mW	J. Ackermann et al, *Thin Solid Films*, **403-404**, 157 (2002).
2) n-Si/4T/Au	0.9	-	-	~0.27 V	>0.6	40 mW	
ITO/M3EH-PPV/PBI/Au	0.71	-	1.96 mA	0.63 V	0.46	80 mW (White Light)	A.J.Breeze et al, *Appl. Phys. Lett.*, **81**, 3085 (2002).

* 1 Power conversion efficiency :

$$\eta_e(\%) = FF \cdot \frac{I_{sc}V_{oc}}{P_{in}} \times 100$$

* 2 External quantum efficiency :

$$\eta_c(\%) = 1240 \cdot \frac{I_{sc}(mA/cm^2)}{P_{in}(mW/cm^2) \cdot \lambda(nm)} \times 100$$

* 3 Short circuit current

* 4 Open circuit voltage

* 5 Fill factor : $FF = \frac{I_m V_m}{I_{sc} V_{oc}}$

* 6 Incident light power

* 7 Fill factor : $FF = \frac{\int_o^{Voc} IdV}{I_{sc} V_{oc}}$

* 8 AM 1.5 : Air Mass 1.5 condition

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