Luminescence Technology Corp.

Summary of Thermally Activated Delayed Fluorescence (TADF) OLEDs

Researchers from Kyushu University that led by Chihaya Adachi developed one kind of new OLED light-emitting fluorescent materials with 100% internal quantum efficiency. They established light emission principle called thermally activated delayed fluorescence (TADF) and worked on designing a material to increase its luminous efficiency.

Now, there are more teams put their effort in this area, more references published and materials used. We can expect that will be great development in the future. Here, We summaries the literatures in recent years to understand TADF OLEDs development.

Short Name	Product No.	PL(nm)	CIE(x,y)	⊿ E_{ST}(eV)	Max EQE(%)	Max current efficiency (cd/A)	Max power efficiency (lm/W)	Reference
TADF Blue Dopant Materials								
CZ-PS	LT-N672	404 nm (in Toluene)	0.15, 0.07	0.32	9.9	-	-	*J. Am. Chem. Soc. 2012, 134, 14706–14709*
2PXZ-TAZ	LT-N675	462 nm	0.16, 0.15	0.86	6.4	-	-	*J. Mater. Chem. C, 2013, 1,4599*
ACRSA	LT-N681	490 nm	-	0.04	16.5	-	-	*Chem. Commun., 2013, 49, 10385*
CC2BP	LT-N684	475 nm	0.17, 0.27	0.14	14.3	25.5	-	*Angew. Chem. 2014, 126, 6520 –6524*
DMAC-DPS	LT-N685	469 nm (in Toluene)	-	0.09	19.5	-	-	*Nature Photonics 8, 326–332 (2014)*
BDPCC-TPTA	LT-N686	463 nm (in Toluene)	0.19, 0.35	0.11	20.6	-	-	*Nature Materials 14, 330-336 (2015)*
BCC-TPTA	LT-N687	462 nm (in Toluene)	0.17, 0.27	0.19	16.8	-	-	*Nature Materials 14, 330-336 (2015)*
CC-TPTA	LT-N688	462 nm (in Toluene)	0.18, 0.28	0.29	14.6	-	-	*Nature Materials 14, 330-336 (2015)*
DCzTrz	LT-N689	449 nm (in Toluene)	0.15, 0.15	0.25	17.8	26.8	22.4	*Adv. Mater. (2015), 27(15), 2515-2520*
DDCzTrz	LT-N690	461 nm (in Toluene)	0.16, 0.22	0.27	18.9	26.2	31.3	*Adv. Mater. (2015), 27(15), 2515-2520*
DMOC-DPS	LT-N691	485 nm (in Toluene)	0.16, 0.16	0.21	14.5	24.0	-	*J. Mater. Chem. C, 2014, 2, 421*
TBPe	LT-E603	487 nm (in THF)	0.17, 0.30	-	8.7	18.0	7.0	*Nature Communications (2014), 5, 4016*
TADF Green Dopant Materials								
TTPA	LT-N507	554 nm (in CH2Cl2)	0.29, 0.59	-	11.7	38.0	30.0	*Nature Communications (2014), 5, 4016*
2PXZ-OXD	LT-N528	502 nm (in Toluene)	0.58, 0.45	0.57	14.9	-	-	*J. Mater. Chem. C, 2013, 1,4599*
ACRXTN	LT-N532	530 nm (in CH2Cl2)	0.29, 0.59	-	11.7	38.0	30.0	*Nature Communications (2014), 5, 4016*
PPZ-3TPT	LT-N533	506 nm (in Toluene)	-	0.30	-	-	-	*Thin Solid Films 496 (2006) 626-630*
DPAA-AF	LT-N536	499 nm (film)	-	0.021	9.6	-	-	*Chem. Lett. 2014, 43, 1017–1019*
[Cu(pytfmpz)-(POP)]BF_4	LT-N537	540 nm (in CH2Cl2)	0.209, 0.326	0.18	8.47	23.68	-	*Chem. Mater. 2013, 25, 3910−3920*
AcPmBPX	LT-N538	490 nm (film)	-	0.05	10.3	23.4	-	*Dalton Transactions (2015), 44(18), 8356-8359*
DDCzIPN	LT-N539	475 nm (in CH2Cl2)	0.22, 0.46	0.13	18.9	-	38.3	*Angew. Chem. 2015, 127, 1-5*
PxPmBPX	LT-N540	530 nm (film)	-	0.02	11.3	35.3	-	*Dalton Transactions (2015), 44(18), 8356-8359*
DHPZ-2BI	LT-N541	550 nm (in CH2Cl2)	-	0.19	12	-	-	*J. Mater. Chem. C, 2015, 3, 2175*
PXZ–DPS	LT-N545	507 nm (in Toluene)	-	0.08	17.5	-	-	*Nature Photonics 8, 326–332 (2014)*
Zn-1	LT-N546	550 nm (in CH2Cl2)	-	0.06	19.6	-	-	*Chem. Commun., 2015, 51, 3181*
3DPA3CN	LT-N547	506 nm (in CH2Cl2)	-	0.103	21.4	-	-	*Chem. Commun., 2015, 51, 5028*
TADF Red Dopant Materials								
TBRb	LT-N732	571 nm (in CH2Cl2)	0.45, 0.53	-	17.2	56.0	33.0	*Nature Communications (2014), 5, 4016*
DBP	LT-N4003	610 nm (in THF)	0.61, 0.39	-	10.9	20.0	10.0	*Nature Communications (2014), 5, 4016*
PPZ-DPS	LT-N774	577 nm (in CH2Cl2)	-	-	5.0	-	-	*Thin Solid Films 496 (2006) 626-630*
TXO-TPA	LT-N775	625 nm (film)	0.45, 0.53	0.052	18.5	43.3	47.4	*Adv. Mater. (2014), 26(30), 5198-5204*
TXO-PhCz	LT-N776	570 nm (film)	0.31, 0.56	0.073	21.5	76.0	70.0	*Adv. Mater. (2014), 26(30), 5198-5204*

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