Table 15.3 Long-term stability test of dye-sensitized TiO_2 solar cells

Institute and reference	Dye	Test conditions	Components	Term	Results
EPFL [6]	N3	150 W W-halogen lamp UV cutoff, 50°C	LiI/LiI_3 in PC or NMO	10 months	J_{SC}: 20–30% decreased initially. Passed charge: 10^5 C cm^{-2}, 10^7 turnovers.
EPFL [13]	N3	800 W m^{-2} Xe lamp UV cutoff	TBAI, I_2 in AN Surlyn + waterglass	100 days	J_{SC} increased and V_{OC} decreased for the first 20 days. The efficiency is constant for 100 days.
EPFL [150]	N3	AM1.5 (1000 W m^{-2}), UV cutoff, 35°C	KI, I_2 in GN	7000 h	J_{SC} increased by 20–30% during the first 1000 h, thereafter reaching a plateau value.
ECN, Solaronix [156]	N3	Fluorescent lamp (1000 W m^{-2}), UV cutoff, 35°C	KI, I_2 in GN Surlyn 1702	9600 h	J_{SC} increased and V_{OC} decreased for the first 2000 h. Passed charge: 103 680 C cm^{-2}.
ECN, INAP, Solaronix [158]	N3	Sulphur lamp (2–3 sun), UV cutoff, 20°C, $\eta = 2\%$	HMImI, LiI, I_2, TBP in MPN Surlyn	8300 h	V_{OC} decreased (50 mV) and J_{SC} increased.
ECN, INAP, Solaronix [158]	N3	UV (10 mW cm^{-2}), 20°C	HMImI, MgI_2, I_2, TBP in AN Surlyn	1500 h	J_{SC} and V_{OC} were constant.
INAP [154]	N3	Sulphur lamp (2.5 sun) UV cutoff, 17°C	LiI, I_2, TBP in MPN	10 000 h	J_{SC} was constant after initial decrease.
NIMC-SOC	N3	AM1.5 (1000 W m^{-2}) UV cutoff, 20°C, $\eta = 5\%$	DMPImI, LiI, I_2, TBP in AN, PN, MPN	4500 h	J_{SC} decreased 5% and V_{OC} was constant. 1.3×10^7 turnovers.
NIMC	Mero-cyanine	AM1.5 (1000 W m^{-2}) UV cutoff, 20°C, $\eta = 3\%$	DMPImI, LiI, I_2 in MAN	1500 h	J_{SC} and V_{OC} were constant. 1×10^6 turnovers.

PC: propylene carbonate, NMO: 3-methyl-2-oxazolidinone, TBAI: tetrabutylammonium iodide, AN: acetonitrile, PN: propionitrile, GN: glutaronitrile, MAN: methoxy-acetonitrile, MPN: 3-methoxypropionitrile, TBP: tert-butylpyridine, HMImI: 1-hexyl-3-methylimidazolium iodide, DMPImI: 1,2-dimethyl-3-propylimidazolium iodide
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