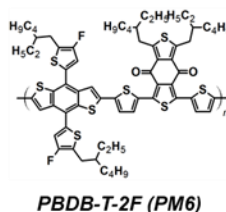
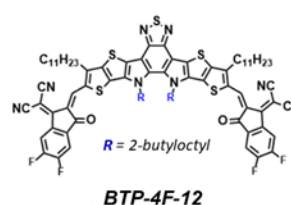

DONOR:

ACCEPTOR:

PCE: 13.5 %
Jsc: 24 mA/cm²
Voc: 0.79 V
FF: 0.71
Device Fabrication:
Device structure

- ITO/ ZnO/BHJ/MoOx /Ag
- The device area was 9 mm²

Substrates:

- ITO on glass substrates are cleaned sequentially by ultra-sonicating 15 minutes with detergent, de-ionized water, acetone and isopropanol
- Substrates are dried with nitrogen flow
- Final pre-treatment under plasma for 3 minutes

ZnO deposition (as per <https://doi.org/10.1002/adma.201004301>):

- Solubilise zinc acetate dihydrate (trace metal grade, 1g) in 11,63 mL methoxyethanol and 277.8 uL ethanolamine
- Sonicate the solution until everything is completely dissolved and agitate vigorously over night.
- The ZnO solgel is filtered on a PVDF 0.45 µm filter.
- Spincoated in air at 3K rpm for 40 seconds (20-30 nm layer)
- Annealed at 200 °C for 10 minutes

BHJ deposition:

- PM6 (20 mg/mL) and BTP-4F-C12 (24 mg/mL) were solubilized separately at 40°C for 4h in **o-xylene**. And stirred overnight at room temperature
- The solutions were mixed in a 1:1 volume ratio (final total concentration 22 mg/ml).
- 0.5% Volume of *p*-Anisaldehyde is added and the resulting solution is heated at 40°C for 30 minutes prior to deposition
- Spin-coat the solution at 40 °C at 2000 rpm on pre-heated substrates at 40°C (in air)
- Film annealed at 160 °C for 10 minutes
- Film thickness is ~ 110 nm

MoOx/Ag

- Electrode deposited using a thermal evaporation system (8 nm MoO₃ and 100 nm silver electrode)

Equipment Used
Plasma chamber

- Spacemaker II sensor, Plasmatic Systems, Inc., USA

Spin-Coater

- Headway Research EC101D Spin-Coater

Evaporator

- Key High vacuum products, Inc, Metal evaporator KV-301
- 7 CFM dual stage mechanical pump
- 3" air cooled diffusion pump (285l/s for air)
- 12" diameter x 18" Pyrex bell jar with imposition guard (evaporation is realized at 3×10^{-7} torr)

Profilometer

- Sloan (now veeco) Dektak IIA Surface Profiler

Solar simulator / SMU

- Keithley 2400 Digital Source Meter
- 150W Oriel Instruments Solar Simulator
- Xenon lamp with AM1.5G filter (No. 81094)
- Intensity of 100 mW/cm² calibrated with a photodiode OSI optoelectronics UV-013D

Questions? Don't hesitate to contact us at info@brilliantmatters.com