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TRANSPARENT HIGH BARRIER FILMS FOR FLEXIBLE ORGANIC ELECTRONIC DEVICES

ORGANIC ELECTRONICS

- New technology for eco-friendly and efficient energy use
- Organic photovoltaic modules (OPV): Large area conversion of solar into electrical energy
- Organic light emitting diodes (OLED): Efficient, thin light sources for illuminations and displays
- Advantages: Flexibility, low weight, cost-effective production by roll-to-roll (R2R) processes, innovative applications

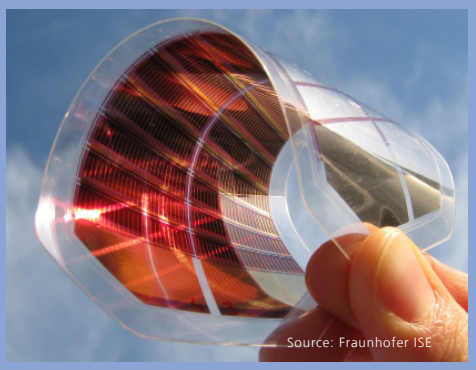
ENCAPSULATION REQUIREMENTS

- Oxygen permeability (at 23°C and 50% RH)
  $\leq 1 \cdot 10^{-3}$ $cm^3 \cdot m^{-2} \cdot d^{-1} \cdot bar^{-1}$ for OPV
  $\leq 1 \cdot 10^{-6}$ $cm^3 \cdot m^{-2} \cdot d^{-1} \cdot bar^{-1}$ for OLED
- Water vapour transmission rate (at 23°C and 85% RH)
  $\leq 5 \cdot 10^{-4}$ $g \cdot d^{-1} \cdot m^{-2}$ for OPV
  $\leq 1 \cdot 10^{-6}$ $g \cdot d^{-1} \cdot m^{-2}$ for OLED
- Damp-heat stability, flexibility, UV and climate stability, transparency

RESEARCH ACTIVITIES IN EU-PROJECTS

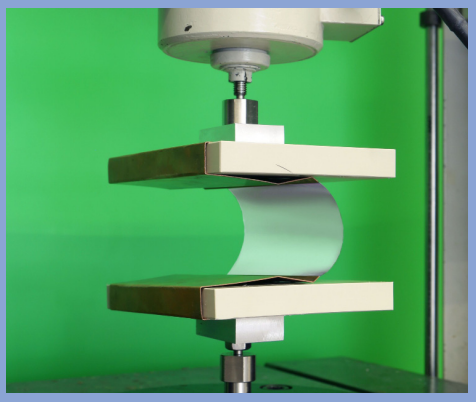
- SUNFLOWER: "Sustainable Novel FLexible Organic Watts Efficiently Reliable" Development of printed OPVs, with efficiencies of 9% (module level), expected lifetime up to 20 years and production costs of 0.7 Eur/Wp, while taking into account the environmental impact and footprint. Contract Nr: 287594
- TREASORES: "Transparent Electrodes for Large Area, Large Scale Production of Organic Optoelectronic Devices" Fabrication of conductive, transparent barrier substrates using R2R processes for optoelectronic devices with high efficiencies and lifetimes above 10000 hours. Contract Nr: 314068
- SMARTONICS: "Development of smart machines, tools and processes for the precision synthesis of novel nanomaterials with tailored properties for Organic Electronics" Novel ultra high-barrier films by process optimization and computational modeling. Contract Nr: 310229

Contact person
Sandra Kiese
Phone +49 8161 491-525
sandra.kiese@ivv.fraunhofer.de



Flexible organic photovoltaic module

Flexible organic light emitting diode


Bending test tool