

# Flexible ITO/PEDOT:PSS Hybrid Transparent Conducting Electrode for Organic Photovoltaics

Kyounga Lim, Sunghoon Jung, Jae-Wook Kang, Jong-Kuk Kim, Do-Geun Kim\*

Plasma Coating Research Group, Korea Institute of Materials Science (KIMS), Changwon 641-831, Korea

Indium Tin Oxide (ITO) has widely been used as a transparent conductive oxide (TCE) for photovoltaic devices. Lately, flexibility of ITO becomes an issue as demand of flexible device increases. Several scientists have tried to substitute ITO to different materials such as conductive polymer, graphene, CNT, and metal nanowire because of ITO brittleness. Among the substitute materials, PEDOT:PSS has mostly paid attention because PEDOT:PSS has excellent flexibility and good conductivity. The conductivity of PEDOT:PSS increases up to 1000 S/cm with additives such as DMSO, EG, sorbitol, and so on. In our research group, we introduce a conductive polymer PEDOT:PSS as a buffer layer to improve not only flexibility but also conductivity. As PEDOT:PSS layer forms beneath ITO thin film (20 nm), sheet resistance decreases from 230  $\Omega/\square$  to 85  $\Omega/\square$  and crack initiation decreases from 4.5 mm to 3.5 mm as well. We have fabricated organic photovoltaic device and power conversion efficiencies using conventional ITO electrode and ITO/PEDOT:PSS hybrid electrode. The photovoltaic property such as power conversion efficiency for ITO/PEDOT:PSS hybrid electrode is comparable to the value obtained using conventional ITO electrode on glass substrate.

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