

### Improving performance of organic bulkheterojunction photodiode with adding cationic surfactants

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Organic photodiode for image sensor application should possess low noise current as well as high photocurrent to achieve high signal-to-noise ratio. In the case of inverted diode structure insertion of ZnO or similar oxide layers between ITO and active layer has been regarded as essential to realize high signal-to-noise ratio. Here we suggest of using cationic surfactant as an additive of blend solution of bulkheterojunction (BHJ) materials and deposition of the solution onto ITO without using ZnO interlayer to avoid various disadvantages of ZnO interlayer such as toxic fabrication process. synergetic effects of cationic surfactant as an additive of BHJ solution, the resulting photodiode structured as ITO/active layer/MoO<sub>3</sub>/Ag showed impressive photodetector characteristics of the specific detectivity of  $\sim 2 \times 10^{12}$  Jones, low noise current level of  $4 \times 10^{-1}$  pA Hz<sup>-0.5</sup> and low dark current of  $1.3 \times 10^{-8}$  A cm<sup>2</sup> at -1 V.