

Roll-to-roll Process of Highly Conductive and Transparent Films from Stable AgNW/PEDOT:PSS One-part Ink : Optimization of Performance and Mechanism of Corrosion

김세열, 김소연, 정문현, 김정훈, 김중현[†]

연세대학교

(jayhkim@yonsei.ac.kr[†])

Those days, greatly increased demand of transparent electrode leads to short supply and price rise of ITO film deposited by sputter coating method due to limitation of coating speed. In addition, flexibility is become one of the essential property of transparent electrode with rapid change of electronics trend. In this work, we developed an effective method to fabricate highly conductive, transparent and stable AgNW/PEDOT:PSS film using roll-to-roll slot-die coating process. This coating technique provides higher line speed capability and greater coating uniformity. Furthermore, the optimized AgNW/PEDOT:PSS solution allows direct one-step coating without any post-treatments such as high temperature annealing, mechanical pressure and solvent washing. We also studied the acid corrosion and atmospheric corrosion of AgNW induced by acidity of PEDOT:PSS and hydrogen sulfide (H₂S) and carbonyl sulfide (OCS) in the atmosphere, respectively. Those corrosion could be prevented by neutralizing the PEDOT:PSS using imidazole which enable to minimize conductivity loss of PEDOT:PSS.