25ᵗʰ Nano Congress for Future Advancements

&

12ᵗʰ Edition of International Conference on

Nanopharmaceutics and Advanced Drug Delivery

August 16-18, 2018 | Dublin, Ireland

Flexible superhydrophobic heater with silver nanowires and carbon nanotubes

Jong Seok Woo[1], Moon Hee Lee[1], Seong Moon Oh[1] and **Joong Tark Han[2]**
[1]Morgan Advanced Materials, South Korea
[2]Korea Electrotechnology Research Institute, South Korea

A smart multifunctional surface of conductive plastics with a superhydrphobic surface having porous micro- and nano-structures can potentially be very useful in many applicatioins of electrostatic dissipation (ESD), electromagnetic interference (EMI) shielding, and in transparent film heaters with self-cleaning properties. Here, we demonstrate a facile and rapid method for fabricating superhydrophobic conductive films from transparent conductive films with silver nanowires (AgNWs) and single-walled carbon nanotubes (SWCNTs) on polycarbonate (PC). This process involves the swelling of the PC surface in a dispersion of multi-walled CNTs (MWCNTs) in methly ethyl ketone (MEK), followed by coaqulation in isopropy alcohol (IPA, nonsolvent for PC). During swelling, the AgNWs and SWCNTs migrated into the plastic, and after that, the swollen PC chains were crystallized in IPA. Notably, by adding MWCNTs in MEK, the crystallization of PC chains was accelerated, and the rapid increase in the eletrical resistivity of the films was minized by reducing the formation of microstructures. Crystallization of the AgNW/SWCNT electrode onto PC and the incorporation of MWCNTs during crystallization provided a flexible superhydrophobic heater for use as a self-cleaning surface. Our results provide a very easy way to fabricate a conductive and superhydrophobic polymer surfaces with lotus-like bionic nanostuctures.

Biography

Jong Seok Woo has completed his PhD from Kyungpook University. He is the Manager of Morgan Advanced Materials in Korea. He has published more than 20 papers in reputed journals.

JustinJongSeok.Woo@morganplc.com

Notes:

Nano Research & Applications
ISSN: 2471-9838

Nano Congress 2018
&
Nano Drug Delivery 2018
August 16-18, 2018

Volume 4

Page 61