Yi-Ting Lee, J Material Sci Eng 2017, 6:3 (Suppl)
DOI: 10.4172/2169-0022-C1-065

Direct fabrication of micro-patterned conductive polymerdevice using spray coating with metal shadow mask

Yi-Ting Lee
National Kaohsiung University of Applied Sciences, Taiwan

In recent years, micro-patterned conductive polymer device have been widely used invarious applications such as flat paneldisplay, organic solar cells, OLED lighting devices,bio-chipsystems, flexibleelectronic sensors and portable optoelectronic products. Therefore, its production method is clearly an important issue of concern. Over theyears,traditionalphotolithography and ink-jet printingare very common process to fabricate micro-patterned conductive polymer device, which generally includes spin coating, photolithography, heating, lift-off and ink-jet processes. The whole processes should be performed in a clean-room environment and depends on extremely expensive equipment. To combat this challenge, we present a simple and direct method for rapid fabricationmicro-patterned conductive polymer deviceon flexible plastic substrateby using spray coatingwith metal shadow mask. In this method, ametal shadow mask with micro-lines array pattern was fabricated by photo-lithography and wetchemical etching process. The metal shadow maskwasplaced onto the flexible plastic substrate to form the stack. The stack was then fixed on the stage of spray coating system. The conductive polymer (PEDOT:PSS) solution was pumped through the nozzle and spray coating on the stack. After proper curing process, the metal shadow mask was removed from flexible plastic substrate. The conductive polymer pattern on flexible plastic substrate was fabricated. In this study, extreme ultraviolet (EUV) radiation was used for surface modification of flexible plastic substrate. The processing condition of spray coatingwith metal shadow mask was also investigated. Finally, thesurface shape, thickness, surfaceroughness and conductivity of the fabricatedconductive polymerpattern deviceswere measured and analyzed. The experimental resultsshow that the method can be appliedforeffective fabrication of flexible electronic device withconductive polymerpattern.

Biography

Yi-Ting Lee is a graduate student at the Mold and Die Engineering Department, National Kaohsiung University of Applied Sciences, Taiwan. Her research interests include micro-fabrication technology, organic polymer processing and fabrication of conductive polymer devices for electronic applications. Dr. Chih-Yuan Chang is her advisor.He received hisPh.D. degree in mechanical engineering from National Taiwan University, Taiwan, in 2006.From 2007 to 2011, he was a Postdoctoral Fellow with the Industrial Technology Research Institute, Taiwan. Since 2012, he has been an Assistant Professor with the Mold and Die Engineering Department, National Kaohsiung University of Applied Sciences, Taiwan.

ting820131@gmail.com

Notes: