Self-assembling of Nanomaterials via Droplet Manipulation for Flexible Optoelectronics Device

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Abstract

Based on the innovation of nanomaterials assembly, droplet manipulation and surface patterning, we accomplished the droplet manipulation strategy via Green Printing technology, which is demonstrated for rapidly patterning materials over a broad range of compositions and accurately achieving the correct position at the micro- and nanoscale. The basic units (dot, line, plane and stereo structures) via the droplet manipulation can be precisely controlled, which contribute the remarkable applications on sensitive electronical skin, flexible display, transparent touch screen, multi-layer circuits and ultra-integrated complex circuits. Nanoparticle-based curves are assembled through pillar-patterned silicon template-induced printing, and integrated as flexible sensors to perform complex recognition of human facial expression.[1] 0D microdots are connected by 1D microwires through regulating the Rayleigh-Taylor instability of materials solution or suspension, which display bright dichromatic photoluminescence.[2] The 3D architectures achieved by two different quantum dots show non-interfering optical properties with feature resolution below 3 μm.[3] The mirofiber-knitted conductive cross-weave patterns are achieved for fabricating multiresolution flexible electronics to monitor whole-body physical kineses.[4] The optimal interconnect leads to a 65.9 percent decrease in the electromagnetic interference.[5]

References

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