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Development of Polymeric Layer for Enhancing The Adhesion of Nano-devices Fabricated by The Nanotransfer Molding Method

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Transfer molding methods have a problem that weak adhesion between nanostructures and substrates. It is important to make various nano scale applications, also the stability of nanostructure on substrate is related with device performance. We studied an effect of poly 4-vinylphenol (PVP) as the polymeric adhesion layer between organic nanowires and a Si substrate when the nanowires are transferred by liquid-bridge-mediated nanotransfer molding method (LB-nTM). Their structural stability was examined by optical microscopy, scanning electron microscopy as multiple transfer molding and washing process. Field-effect transistors were fabricated with organic semiconductor nanowires on a polymeric adhesion layer and their electrical properties showed no significant difference as the one without the adhesion layer. As a result, adhesion layer can be used in the washing process and making multi-layer nano-scale patterns.

Keywords: Polymeric adhesion layer, Nanotransfer molding method