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TM-P014

Large-area single-crystal organic patterned thin films by vertically confined lateral crystal growth via capillary force lithography

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A one-step fabrication method for single-crystal organic thin films guided through vertically confined lateral crystal growth via capillary force lithography (VC-LCG via CLF) was introduced. We used ink solution of organic molecules that can self-assemble and crystallize within the vertically confined channels of patterned molds. Vertical confinement played an important role with regard to the crystallization and formation of single-crystalline organic thin films. It was also useful for fabricating thin film transistors, with high performance electrical properties.

Keywords : Single crystal organic thin film Large-area fabrication Vertical confinement High mobility Organic field-effect transistor Capillary force lithography

TM-P015

Artificial synapse based on 2D van der Waals heterostructure

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Here, we demonstrate a synaptic device on a vdW heterostructure (h-BN/WSe₂). The conductance related to the synaptic weight is adjusted by the charges trapped in the weight control layer that is formed on h-BN by O₂ plasma treatment. This vdW synaptic device shows good linearity with nonlinearity = 1.4/1.4 for weight increase/decrease, a number of conductance state about 500, and small variation below 1% after the random state changes pulses. These synaptic properties clearly highlight the potential of our vdW synaptic device for building highly accurate artificial neural network.

Keywords : Neuromorphic, Artificial Synapse, Van der Waals Heterostructure