Advanced technology for improvement of morphology and crystal structure continuity of water-borne colloidal film for high performance organic semiconductor devices

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Up to now, commercial interest in the environmentally friendly processing of organic semiconductors is on the rise. To reduce noxious solvent use and to realize water-borne colloids of organic semiconductors, we developed a universal and eco-friendly miniemulsion process for wide use. As a result, we established universal method that can be applied to fullerene derivatives as well as the latest organic semiconductors with planar backbones. Based on this technique, we fabricated for the first time a high-performance complementary inverter, solar cell and photodiode using water as a processing solvent.