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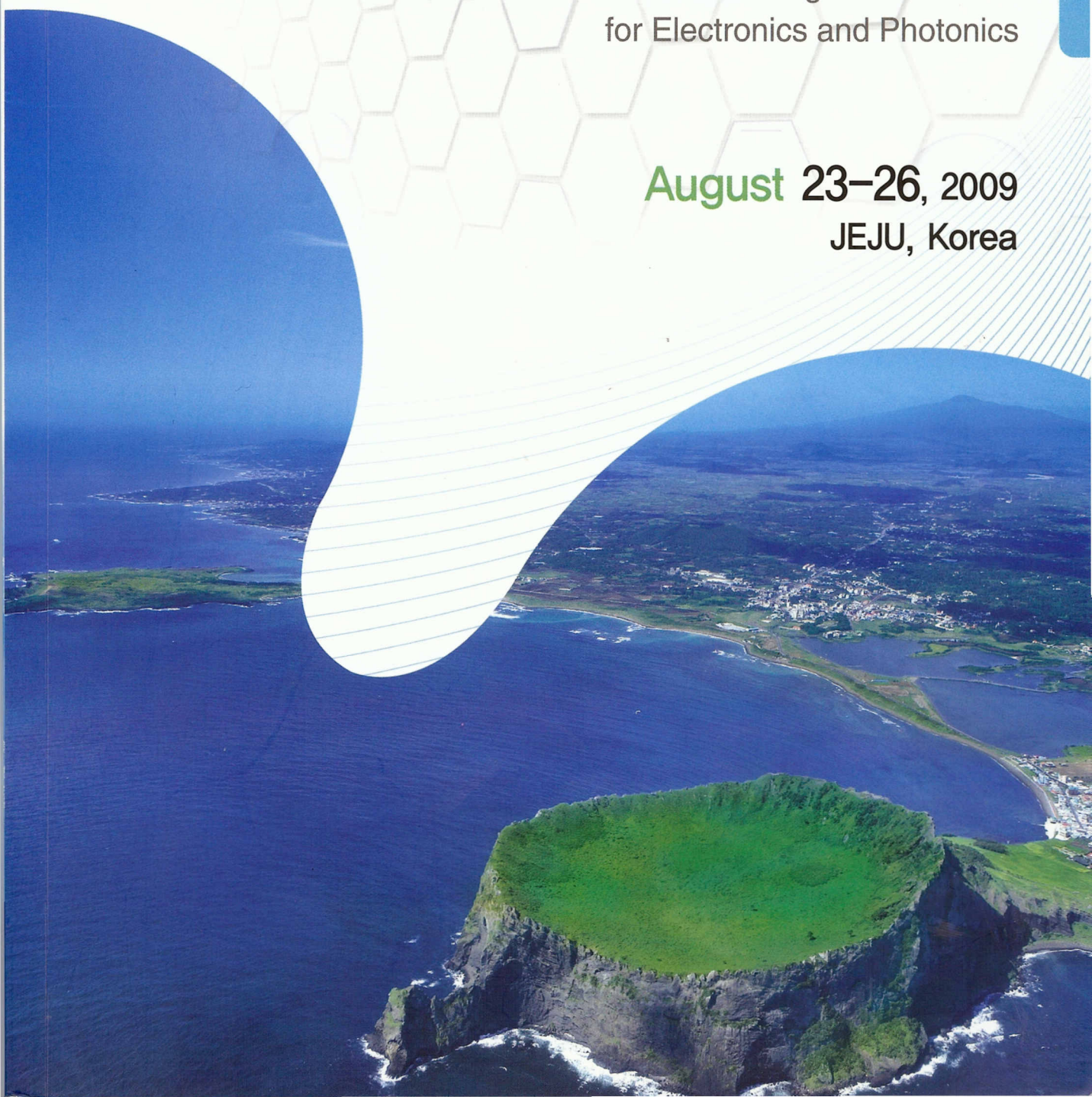

P220

Fabrication and Optoelectronic Characteristics of Organic Copper phthalocyanine (CuPc) Nanowires and Transformed Rectangular Nanopipes

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We fabricated organic semiconducting copper phthalocyanine (CuPc) nanowires by chemically self-assembly method with trifluoroacetic acid in a chloroform solution. The mechanism of chemical self-assembly for the CuPc nanowires is studied through the analysis of Fourier transform infrared spectra. After hydrothermal process, we observed that CuPc nanowires were transformed to CuPc rectangular nanopipes with empty inside from scanning electron microscopy, as shown in Fig. 1. From the x-ray diffraction patterns, it is observed that α-phase CuPc nanowires were structurally transformed to β-phase rectangular nanopipes, with crystallinity at (-101) direction. The optical and electrical characteristics of α-phase CuPc nanowires were compared with those of β-phase crystalline CuPc rectangular nanopipes using UV/Vis absorption spectra and current-voltage (*I-V*) characteristics with applying gate field and incident light. From the photo-responsive and gate field-dependent *I-V* characteristics, improved optoelectronic device performance in terms of mobility and current on/off ratio have been observed in the β-phase CuPc crystalline rectangular nanopipes, compared with the self-assembled α-phase CuPc nanowires, because of a relatively strong π-π interaction between the CuPc molecules.

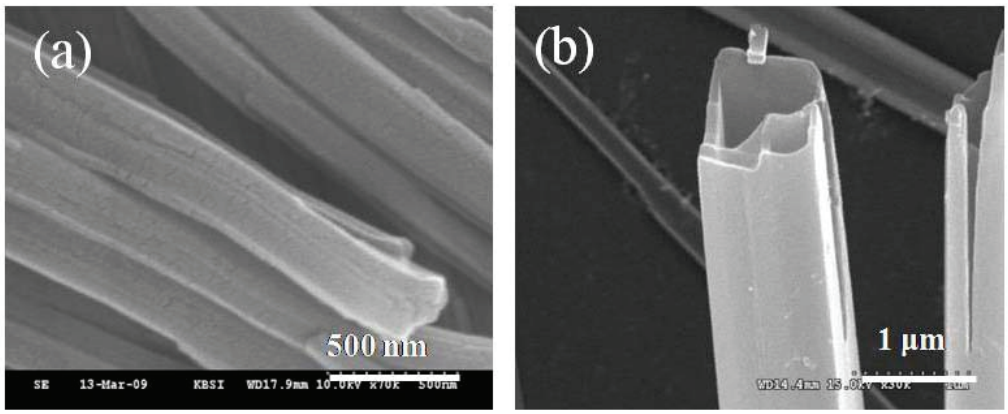

Figure 1. SEM images of (a) self-assembled CuPc nanowires (b) hydrothermal followed annealing treated CuPc rectangular nanotubes.

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