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Polymer Chemistry, Polymer Physics, Optoelectronic Nanomaterials

We are "Polymer Optoelectronic Nanomaterials Lab" (Figure 1) of the Applied Chemistry Department, NCTU. Our primary research interests include the following three major parts:

(a) **Polymer Nanomaterials by the Template Method:** By wetting polymer melts or solutions into the nanopores of anodic aluminum oxide (AAO) templates, we are able to control the morphologies and properties of polymer nanomaterials (Figure 2).

(b) **Polymer Fibers by Electrospinning**: By ejecting polymer solution jets in electric fields, we are able to prepare micrometer or nanometer polymer fibers (Figure 3).

(c) **Self-Assembled Polymer nanostructures:** The conjugated polymer nanostructures can be used for field-effect transistors, thermoelectric devices, or organic solar cells (Figure 4).

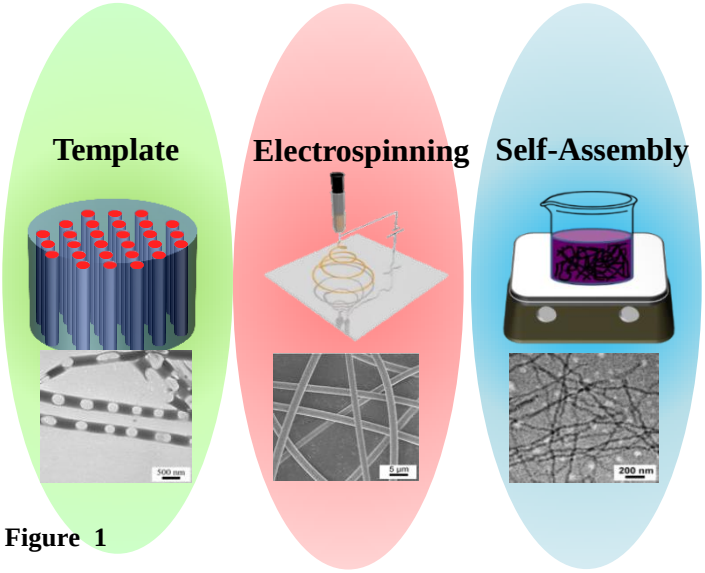

Figure 1

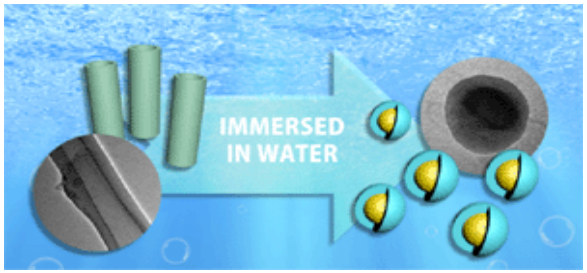

Figure 2

Using nanoporous templates and the double solution wetting method developed in our group to fabricate core-shell polymer nanoparticles.

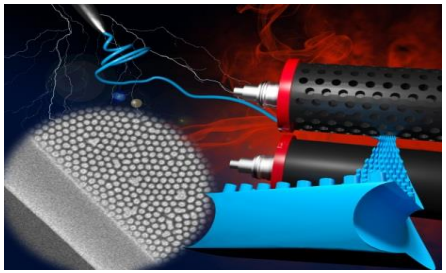

Figure 3

Thermally annealing and pressing electrospun polymer fibers to prepare polymer fibers with non-spherical cross-sections.

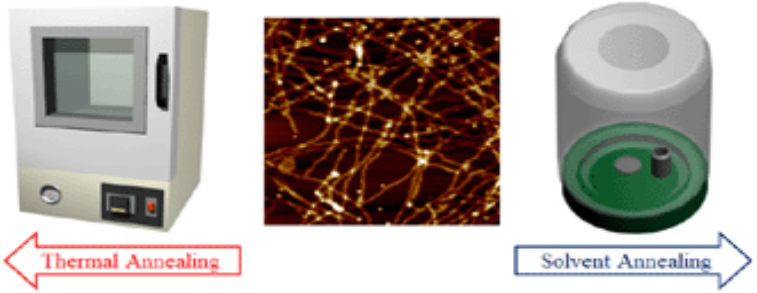

Figure 4

Dissolving poly(3-hexylthiophene) (P3HT) in a marginal solvent to synthesize P3HT nanowires, whose morphologies and optoelectronic properties can be controlled by post-treatments.