

**Self-assembly of sub-100 nm conjugated polymer nanoparticles by a phospholipid with a hydrophobically modified polar head**

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Polymers with donor-acceptor structure units can absorb a wide range of sunlight and efficiently emit heat rays instead of photoluminescence, thereby being an ideal photothermal material. In this work, we present conjugated polymer nanoparticles (CPNs) assembled with a phospholipid with a polar head modified by acetic acid. We found that uniform CPNs with a sub-100 nm diameter were prepared by shattering phase-separated film of the conjugate polymer and phospholipid. Analysis by conducting atomic force microscopy, grazing incident X-ray diffraction and small angle neutron scattering revealed the assembly structures of the phase-separated films and CPNs. It was presumed that the highly-ordered assembly structures of the conjugated polymer and phospholipid were responsible for the enhancement in the photothermal energy conversion.