

TITLE	VISIBLE LIGHT-INDUCED SURFACTAN-FREE EMULSION POLYMERIZATION USING CAMPHORQUINONE/TERTIARY AMINE AS THE INITIATING SYSTEM FOR THE SYNTHESIS OF AMINE-FUNCTIONALIZED COLLOIDAL NANOPARTICLES
AUTHOR	MONTRI RATANAJANCHAI
DEGREE	DOCTOR OF PHILOSOPHY PROGRAM IN POLYMER SCIENCE AND TECHNOLOGY (INTERNATIONAL PROGRAM)
FACULTY	FACULTY OF SCIENCE
ABSTRACT	<p>A visible light-induced surfactant-free emulsion polymerization (SFEP) was developed as an alternative pathway for the preparation of amine-functionalized nanoparticles by using the photo-initiating system consisting of camphorquinone coupled with tertiary amine (CQ/3°-amine). Water-soluble macromolecules containing 3°-amines were used as the sources of 3°-amine species, which not only function with CQ to generate initiating free radicals, but also provide colloidal stabilization to the resulting colloidal products. The prepared nanoparticles showed uniformed size distribution and good colloidal stability with positively charged surface. For SFEP induced by CQ/polyethyleneimine (PEI) photo-redox couple, the polymerization of methyl methacrylate (MMA) was affected by both light intensity and initiator concentration. In addition, to obtain higher solid content products, the weight ratio of PEI:MMA = 1:4 was employed. Finally, an opportunity for immobilizing various amine containing polymers by our photo-induced SFEP was evaluated. The achievement of this SFEP also depended on 3°-amine content of the macromolecules used.</p>