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Green printing nano-technology for manufacturing photonic and electronic devices

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Nanoparticles have aroused great attentions due to their board applications. The research and development of pigment nanoparticles has greatly improved the performance of printing products. Based on design and preparation of mono dispersed nanoparticles, we have developed a simple method for assembly of large-area polymer photonic crystals (PCs), and achieved large-scale PCs by inkjet printing and spray coating, as-prepared colloidal PCs posses high mechanical strength, controllable wettability, and tunable stopbands. The extended applications of colloidal PCs are demonstrated in high density information storage, ultra-sensitive detecting, high-efficient catalysis. Based on preparation of nano-composite transfer materials and modification of surface structure and property of plate, we have developed a green platemaking process for printing, which avoids discharge of chemical pollutant during traditional platemaking processes. The development of metal nanoparticle inks is expected to achieve a green revolution in printed circuit board industry, i.e. metal nano-particles could be applied as ink to print conductive circuit directly, which simplifies the complicated preparation process of traditional photolithography method, and significantly prevents discharge of chemical pollutant. Over all, nanoparticles have shown promising prospects in industry, and will lead the printing industry into a new age of greenization and digitalization.

Biography

Yanlin Song is the Director of Key Laboratory of Green Printing, Chinese Academy of Sciences. He won the First Prize of Beijing Science and Technology Award, the Second Prize of National Natural Science Award, the National Science Fund for Distinguished Young Scholars, the Prestigious Chinese Chemical Society-Akzo Nobel Chemistry Award, The Outstanding Youth Award of Chinese Academy of Sciences, and the Outstanding Youth Achievement Award of China Association for Science and Technology. His research interests include information function materials, application of polymers photonic crystals, green-printing materials and technology.

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