

International Conference and Exhibition on Polymer Chemistry

November 14-16, 2016 Atlanta, USA

Printed manufacture ultra-integrated multi-analysis devices

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Focusing on toilless and high-performed multi-recognition, we design novel detection methods and sensor materials including facile fabrication processes. 1) We designed and fabricated a multi-stopband PCs microchip based on hydrophilic-hydrophobic patterned substrate. The microchip can selectively amplify the sensing fluorescence in different channels, and perform a high-efficient multi-analyte discriminant testing. The facile fabrication of high-performance PCs microchip and the insight of sensing efficiency evaluation will be of great importance for the development of advanced discriminant analysis for complex analytes in luminescence sensing systems and devices. 2) We investigated the correlative multi-states properties of a photochromic sensor, which is capable of a selective and cross-reactive sensor array for discriminated multi-analytes detection by just one sensing compound. The multi-testing sensor array performed in dark, ultraviolet or visual stimulation, corresponding to different molecular states of spirooxazine metal ions coordination. 3) Printed flexible electronics are drawing enthusiastic attention, because of their features and promising applications in flexible displays, artificial skins, sensors, etc. We demonstrated a feasible strategy to assembly nanoparticles into micro or nanocurves. The curves with various tortuosity morphologies have differential resistive strain sensitivity, which can be integrated to multi-analysis flexible sensor. The printable sensor performed sensitive and stable resistance response on deformations, which could run complicated facial expression recognition, and contribute the remarkable application on skin micromotion manipulation auxiliary apparatuses for paraplegics.

Biography

Fengyu Li is an Associate Professor of Institute of Chemistry, Chinese Academy of Sciences. His research interests include photonic crystal materials, high-performance multi-analyte sensing, nanoreactor, printed wearable chip, 3D printing manufacture. His publication includes *Angew. Chem. Int. Ed.*, *Adv. Mater.*, *Adv. Funct. Mater.*, *Anal. Chem.*, *Sci. Rep.* etc. He was invited to contribute two chapters in relative academic books. As the International Electrotechnical Commission (IEC) member, he proposed the first printed electronics international standard for China. As the penner and expert, he also drafted the Chinese Printing Manufacture Technology Roadmap.

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