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**[Department Spotlight] Professor Chih-Hsin Chen’s Research Team Publishes Two Consecutive Papers in Leading International Journals**

**Campus focus**

Professor Chih-Hsin Chen, Chair of the Department of Chemistry, co-published two papers with his students. The first, co-authored with postdoctoral researcher Rajib Nandi and senior student Yung-Jung Chuang, is titled “Liquid crystal sensor for Cr (III)-citrate detection via interfacial coagulation”, and was published in Analytica Chimica Acta, a top-tier Q1 journal with an impact factor of 5.7. The second paper, authored by master’s student Wen-Hao Zhang under Professor Chen’s supervision, is titled “Cyano-Substituted Bis((benzothiophen-2-yl)pyridine) (acetylacetonate) Iridium Complexes for Efficient and Stable Deep Red Organic Light-Emitting Diodes Emitting at 673 nm”, and appeared in the Q1 journal Dyes and Pigments, which has an impact factor of 4.1.
  
Dr. Rajib Nandi and Yung-Jung Chuang developed the sensor using a unique phosphonium ion material (THPB) blended with liquid crystals. When detecting toxic Cr (III)-citrate, the sensor shifts from a dark to a bright optical state, allowing for naked-eye real-time detection. Professor Chen noted that this technique offers high selectivity and a sensitivity of 5 µM, all without the need for expensive instruments, making it ideal for on-site water quality monitoring and providing a simple, fast, and effective tool for detecting heavy metal pollution in the environment.
  
Yung-Jung Chuang, who has been admitted to the Institute of Analytical and Environmental Sciences at National Tsing Hua University, expressed her desire to integrate this method with other metal ion detection technologies developed by her seniors. She hopes to co-design a multifunctional liquid crystal sensor capable of detecting multiple analytes using different probe molecules. “With the right combinations, we may be able to detect various targets using a single device,” she said.
  
Wen-Hao Zhang, who has now graduated, explained that the newly developed deep red organic light-emitting material features excellent luminescence efficiency and stability. The fabricated OLED device achieved an external quantum efficiency (EQE) of 10.2%. It demonstrated a lifetime of 190 hours at 200 cd/m² brightness, making it one of the best-performing deep red OLEDs reported to date. “These deep red materials are well-suited for high-end displays and near-infrared sensing, and also show promise in biomedical applications like photodynamic therapy,” he added. The materials are also simple to synthesize, indicating potential for broader applications in agricultural lighting and display technologies, showcasing Taiwan’s innovative strength in developing organic optoelectronic materials.







