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Editorial

Editorial: Organic Fluorescent Materials as Chemical Sensors

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The last two decades have witnessed a significant development of fluorescent chemosensors with high sensitivity and selectivity, fast response and *in situ* detection. Among these chemical sensors, organic fluorescent materials exhibited great potential for the detection of a wide range of analytes, due to their flexible synthesis, convenient processing and good biocompatibility [1]. Consequently, a number of fluorescent organic molecules, macrocycles, synthetic polymers, nanoassemblies and their composites have been designed and applied to various sensors, probes and imaging agents [1,2]. In this thematic issue, the most recent advancements in organic fluorescent materials as chemical sensors are highlighted. This issue is composed of four review articles and four research articles, which well covered the different type of organic materials for fluorescence sensing and imaging.

Molecular fluorophores are the most frequently used fluorescent sensors for ionic species. As one of the most important anions involved in biological process, the precise detection of hypochlorite (ClO^-) is of great importance. Y. Shiraishi and coworkers [3] developed a naphthalimide–sulfonylhydrazine conjugate with an imine (C=N) linker, which can be used as an effective fluorescent chemodosimeter for ClO^-. The emission of the conjugate molecule was greatly enhanced upon reaction with the anion at physiological pH, which allows fluorescence imaging in the presence of living cells. K. Chansaenpak and co-workers [4] synthesized a BODIPY-based fluorescent probe for the "turn-on" detection of another important ionic specie involved in biological activity, Fe^{3+} ions. High selectivity and sensitivity were observed, and the sensing ability was also tested by live cell imaging.

Aromatic heterocyclic moieties have played a pivotal role in the fluorescence sensing systems owing to their unique response to metal ions, proton and other species [5]. W. Dehaen and coworkers [6] provided an overview of the research on bicyclic 1,3a,6a-triazapentalene, a heterocyclic chromophore that has attracted attention only recently. The review focused on the synthetic methodologies of this group of molecules and discussed the substituent effects on the fluorescence properties as well as their use in bioimaging. C. Fang and coworkers [7] designed a dialkylamino fluorophore with imidazole moiety by engineering the green fluorescent protein (GFP) chromophore. It showed a significant polarity-dependent emission and can potentially act as an environment-polarity sensor for in vitro and in vivo applications.

As a representative fluorescence scaffold with strong and tunable emission, arene diimide in particular naphthalene diimide and perylene imide, has been widely investigated [8,9]. L. Zang and coworkers reviewed the recent research on perylene imide sensors and arrays for vapor chemical detection with fluorescent and colorimetric signal output [10]. The sensors include organic molecules, polymers and nanocomposites and the analytes cover explosives, biomarkers, benzene homologs, organic peroxides, phenols, etc. Targeting another representative fluorophore scaffold family, Dzyuba and coworkers [11] highlighted the versatility of modular assemblies of squaraine-based chemosensors. Various structurally and functionally diverse recognition motifs are discussed.

Aggregation-induced emission (AIE) active materials have demonstrated enormous advantages in light-emitting systems [12]. A. Pucci and coworkers [13] used two AIE active molecules as the fluorescent probes for the real-time monitoring of polyurethane synthesis.

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The working mechanism is that the molecules have viscosity-dependent emission intensity due to the molecular motor effect, which might find its application in polymer industry as a low-cost detection method. This work was highlighted as the front cover in the first issue of *Chemosensors* in 2021.

Macrocycles are representative building blocks in supramolecular chemistry. W. Dehaen and coworkers [14] summarized the development of macrocyclic arenes functionalized with boron-dipyrromethene (BODIPY) including calixarenes, resorcinarenes and pillararenes, such as novel chemosensors and smart materials. This review is of interest for the researchers in both macrocyclic chemistry and fluorescent materials.

To end, I would like to thank all the authors who contributed with their excellent research work to this thematic issue. I also thank the reviewers for their efforts in the peer review process, which improved the quality of the manuscripts for publication, as well as all the editors involved.

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