学術変革Bスケール横断分析セミナー

第 87回「工学とバイオ」セミナー/ MMCもしかする未来の化学

From Molecules to Monitoring: Naphthalimide Fluorophores in Chemical Sensing

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Date: Mar. 18, 2026 (16:00~16:45)

Place: IIS, An404

Abstract :

This talk presents our recent advances in the development of naphthalimide-based fluorescent sensors as robust and versatile platforms for chemical and biological detection. By integrating the favourable photophysical properties of the naphthalimide fluorophore with rationally designed molecular recognition units, we have established adaptable sensing systems for a range of analytically important targets. Key outcomes of this work include highly sensitive and selective fluorescent probes for toxic gases relevant to environmental and health-related monitoring, clinically important heparin, selected anions such as fluoride, and metal ions including Zn^{2+}, Al^{3+} and Cu^{2+}. These sensors display distinct fluorescence responses-turn-on, turn-off, or ratiometric-arising from well-defined mechanisms such as photoinduced electron transfer (PET) and intramolecular charge transfer (ICT). Several systems operate efficiently under aqueous conditions, demonstrating low detection limits, good selectivity, and reversible sensing behaviour, which enable real-time analysis. Overall, this talk will highlight the potential of naphthalimide fluorophores as multifunctional sensing platforms, bridging fundamental molecular design with practical applications in environmental analysis, chemical sensing, and biomedical diagnostics.

学術変革領域研究(B)
スケール横断分析
Cross-scale Analysis

CREMeB
Center for Research on Engineering in Medicine and Biology

References :

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[2] Anal. Sens. 2026

[3] Small Sci. 2025

[4]Ind.Eng.Chem. Res. 2025

[5]ACS Meas. Sci. Au.2025

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