

新規ジフェニルシリルピレン誘導体の合成と蛍光特性

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Synthesis of novel diphenylsilylpyrene derivatives directed to fluorescent labeling of DNA
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In recent years, genetic analysis using fluorescent-labeled nucleic acids has involved extensive research into fluorescent substances for incorporation into probes. There is an increasing demand for near-infrared fluorescent labeling agents with excellent chemical and photochemical stability, enabling real-time detection within living organisms. Achieving longer emission wavelengths and heightened fluorescence intensity has become a primary focus.

Within our laboratory, our focus has centered on studying silylated pyrene derivatives, where pyrene is modified with silicon atoms. This study specifically delves into enhancing the fluorescent properties of silylated pyrene by concentrating on the substituents on the silicon. We synthesized new silylated pyrene derivatives by introducing a diphenyl group, aiming to augment their fluorescence. This synthesis involved incorporating a diphenyl group into vinylsilane as a silylating agent and subsequently reacting it with pyrene. The fluorescence properties resulting from these introduced substituents were thoroughly elucidated and evaluated as potential fluorescent probes.

Keywords : *Fluorescent Labeling Agents; Silylated pyrene*

近年、蛍光標識核酸を用いた遺伝子解析ではプローブに導入する蛍光物質について長らく研究が行われている。蛍光物質には生体内でリアルタイム検出を可能にするような化学的安定性と光化学的安定性に優れた近赤外蛍光標識剤の必要性が高まっており、発光波長の長波長化、さらに蛍光強度の増強が目標となってきた。当研究室では、蛍光性をもつピレンをケイ素原子で修飾したシリル化ピレン誘導体の研究を行ってきた。本実験ではシリル化ピレンのケイ素上の置換基に注目し、ジフェニル基を導入した新規シリル化ピレン誘導体の合成を行い、蛍光特性の改良を試みた。ビニルシランにジフェニル基を導入したシリル化剤とし、ピレンと反応させることで合成を行った。置換基の導入による蛍光特性を明らかにし、蛍光プローブとしての評価を行う。

