

## 各種溶媒中での芳香環フッ素化ペンタメチンシアニン色素の特性

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Properties of aromatic ring-fluorinated pentamethine cyanine dye in various solvents (<sup>1</sup>*Department of Materials Science and Processing Graduate School of Natural Science and Technology, Gifu University*, <sup>2</sup>*Department of Chemistry and Biomolecular Science, Faculty of Engineering, Gifu University*, <sup>3</sup>*Life Science Research Center Division of Instrumental Analysis, Gifu University*) ○ Saki Kamiya,<sup>1</sup> Yasuhiro Kubota,<sup>2</sup> Toshiyasu Inuzuka,<sup>3</sup> Kazumasa Funabiki<sup>2</sup>

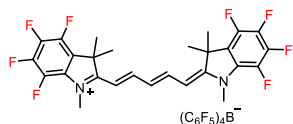
A colorimetric chemical sensor is a method for detecting a target molecule by coloring or luminescence. The colorimetric chemical sensor has advantages such as observation with the naked eye without using any special equipments.

In this study, we investigated the ultraviolet-visible absorption and fluorescence characteristics in various solvents using an aromatic ring-fluorinated pentamethine cyanine dye. That is, when the aromatic ring-fluorinated pentamethine cyanine dye was dissolved in various solvents and the ultraviolet-visible absorption and fluorescence spectra were measured, the maximum absorption wavelength ( $\lambda_{\max}$ ) was observed around 650 nm in toluene, AcOEt,  $\text{CHCl}_3$ ,  $\text{CH}_2\text{Cl}_2$ , and acetone. As shown, in MeCN, 2-PrOH, 1-PrOH, EtOH, MeOH, DMSO, the absorbance at  $\lambda_{\max}$  in 630-660 nm decreased, and a new peak was observed around 350 nm. In addition, when excited at  $\lambda_{\max}$  (650 nm), it showed fluorescence from 650 to 680 nm, but no fluorescence was observed even when the peak near 350 nm was excited (Figs. 2, 3).

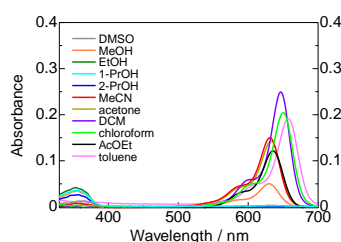
**Keywords** : pentamethine cyanine dye; ring-fluorination; fluorescence

カラリメトリック化学センサーとは、ターゲット分子を着色や発光によって検出する方法である。特殊な機器を使わず裸眼で観察できることがカラリメトリック化学センサーの長所である。

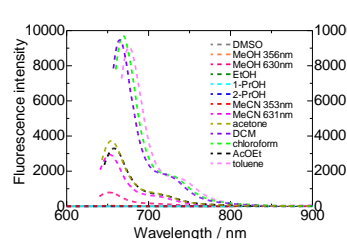
本研究では、芳香環フッ素化ペンタメチンシアニン色素を用いて各種溶媒中での紫外-可視吸収および蛍光特性について検討した。すなわち、芳香環フッ素化ペンタメチンシアニン色素を各種溶媒に溶かし、紫外-可視吸収および蛍光スペクトルを測定したところ、toluene, AcOEt,  $\text{CHCl}_3$ ,  $\text{CH}_2\text{Cl}_2$ , acetone 中では 650 nm 付近に最大吸収波長( $\lambda_{\max}$ )を示したが、MeCN, 2-PrOH, 1-PrOH, EtOH, MeOH, DMSO 中では 630~660 nm の  $\lambda_{\max}$  の absorbance が低下し、350 nm 付近に新しい peak が観察された。また、650 nm 付近の  $\lambda_{\max}$  で励起した時 650~680 nm に蛍光を示したが、350 nm 付近の peak を励起しても蛍光は観測されなかった(図 2, 3)。



**Fig. 1.** Ring-fluorinated pentamethine cyanine dye



**Fig. 2.** UV-vis spectrum



**Fig. 3.** Fluorescence spectrum