



# Fluorescence and Chemiluminescence Behavior of Distyrylbenzene Bearing Two Arms of Dipicolylaminomethyl Groups: Interactions with Zinc Ion and ATP

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## ABSTRACT

The absorption and fluorescence spectral study of the distyrylbenzene bearing two arms of the dipicolylaminomethyl groups, the effective ligands for  $Zn^{2+}$ , was studied in the presence of  $Zn^{2+}$  and ATP. Upon complexation of the distyrylbenzene with zinc ions in acetonitrile, enhancement of the fluorescence intensity was observed due to inhibition of intramolecular PET (photo-induced electron transfer) quenching, but no effect was found in aqueous media because the equilibrium laid to the free form of the ligands. In contrast, the addition of ATP disodium salt was effective to enhance the fluorescence intensity of the combination of the distyrylbenzene and  $Zn^{2+}$  in aqueous media. This assembly was applied to the peroxyoxalate chemiluminescence system and a significant increase in the intensity was observed, which provides a potential detection for ATP by chemiluminescence.

**Keywords:** Fluorescence; Chemiluminescence; Distyrylbenzene; Dipicolylaminomethyl group; zinc ion; Complex; ATP

## 1. Introduction

Due to the extremely increasing importance of the detection and visualization of biological substrates that are playing a critical role in living cells, a number of fluorescent probes with sensitive sites to such molecules have been developed [1,2]. Of the substrates taking part in various biological processes, much attention has focused on the development of fluorescent probes for

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