

Fluorogenic Probes for Detection of Formaldehyde in Cells

Sookil Park, Jinsung Tae and Injae Shin*

Department of Chemistry, Yonsei University, Seoul 03722, Korea.

E-mail: chemskpark@yonsei.ac.kr

Reactive carbonyl species (RCS) that are generated through metabolic processes are very reactive and, thus, their overproduction results in damages to various organisms. Formaldehyde (FA), the simplest RCS, is a human toxin and carcinogen as a result of its ability to crosslink DNA and proteins. For the detection of FA in aqueous media and live cells, we created rhodamine-based cyclic hydrazide derivatives as fluorescent probes. Addition of FA to the probes in aqueous buffer led to an increase in fluorescence intensity within a few minutes. Also, the probes responded to FA but not to other biologically relevant species, indicating that they have a high selectivity toward FA. Moreover, probe **1** was able to detect exogenous and endogenous FA in live cells. Consequently, this probe should be useful in efforts aimed at gaining a more detailed understanding of FA-associated biological events.

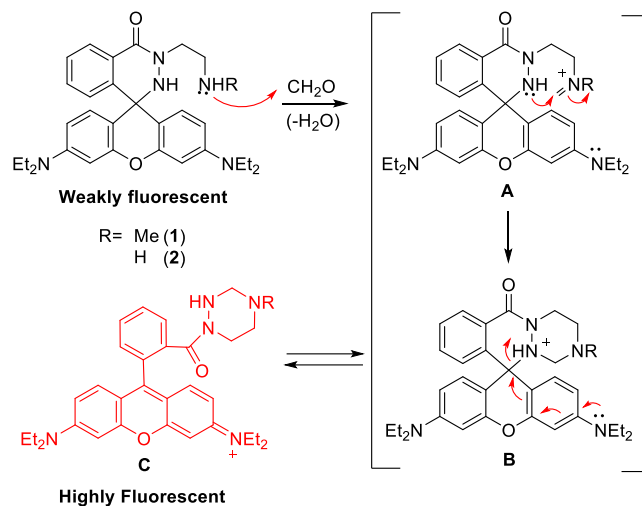


Figure 1. The proposed mechanism of fluorescence sensing of formaldehyde by rhodamine cyclic hydrazide-based probes **1** and **2**.