

## Enzyme based biosensor for organophosphates estimation employing metal enhanced fluorescence

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Currently among the various groups of pesticides that are being used all over the world, organophosphorus pesticides form a major and most widely used group accounting for more than 36 % of total world market. In the present study we report the detection of Paraoxon in the standard sample by conjugate of the Organophosphorus hydrolase (OPH) and Pyranine in the range of 0.1ppm to 5ppm. The hydrolysis of the paraoxon by the enzyme decreases the pH in its vicinity which is being detected by the pH reporter fluorophore. Free Pyranine exhibits high fluorescence quantum yield but fluorescence of pyranine bound to proteins is self quenched which is

undesirable. Colloidal silver was deposited onto glass slides and then was coated with the pyranine labeled OPH. Fluorescence properties of bioconjugate (OPH+ Pyranine) layer on silver island film was studied and an increase in the excitation intensity of the pyranine was observed which further led to enhanced emission intensity. As the detection method is fluorescence based, increase in the fluorescence signal would be correlated to the increased sensitivity of the developed biosensor. The present limit of detection would further be lowered with the aid of metal enhanced fluorescence phenomena in sub ppb range.

### Biography

Prof D K Bhattacharyya is Professor at Bengal Engineering & Science University, Shivpur, Howrah, West Bengal. Sibaji Kumar Sanyal has completed his MSc from Amity University and currently working as a junior research fellow at Mustard Research & Promotion Consortium.