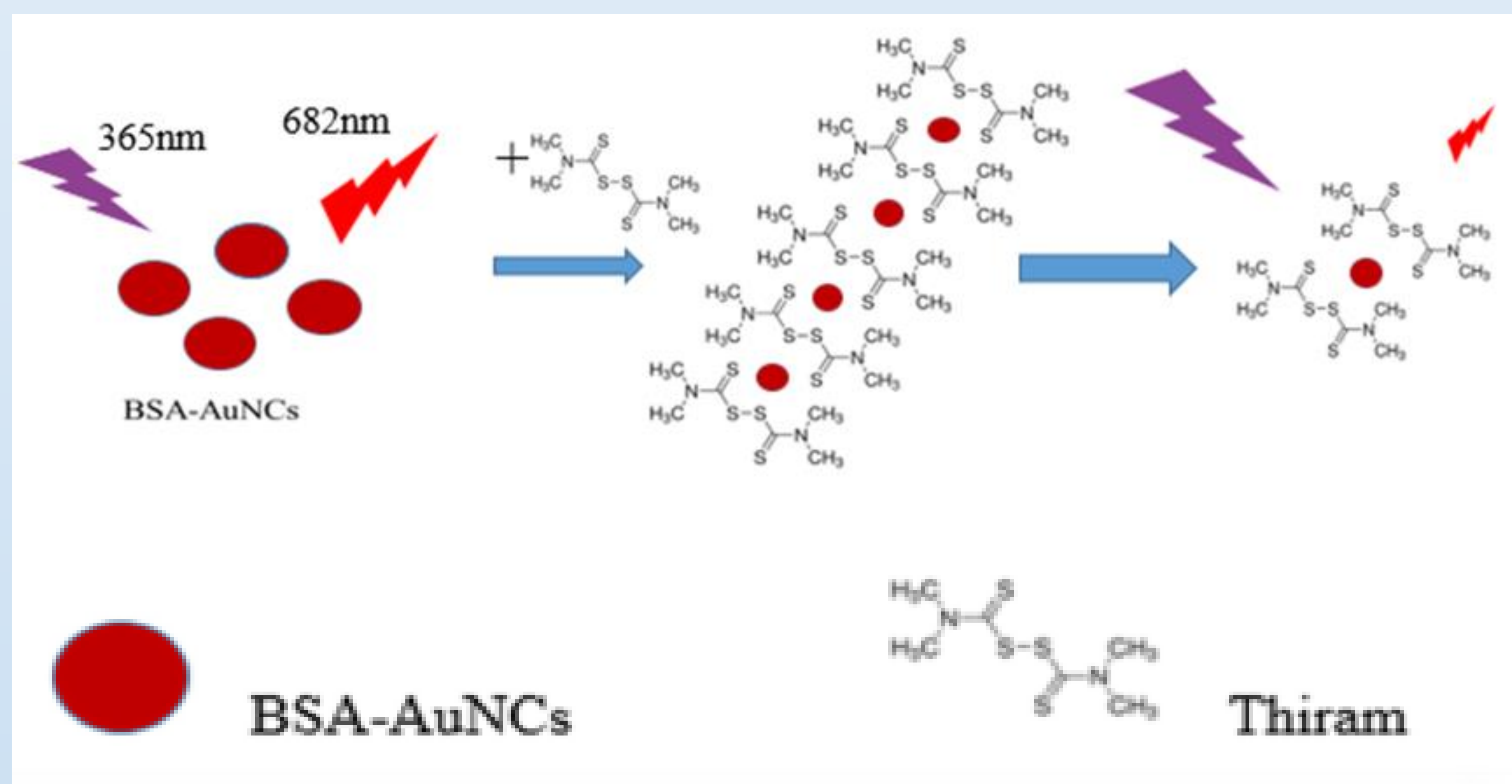


# Detection of thiram in water samples by bovine serum albumin-coated gold nanoclusters

利用牛血清蛋白包覆之金奈米團簇檢測水樣中得恩地

## Abstract:

In this study, the use of bovine serum albumin-coated gold nanoclusters in the detection of water samples of the grace, because the gold easily with the thiol group to form a bond, so the use of its characteristics and the cluster of gold nucleus and grace on the ground. The linear range is between 0.5 ppm and 8 ppm, and the detection limit is 0.28ppm ,  $R^2= 0.992$



Scheme 1. Schematic procedure for thiram sensor.

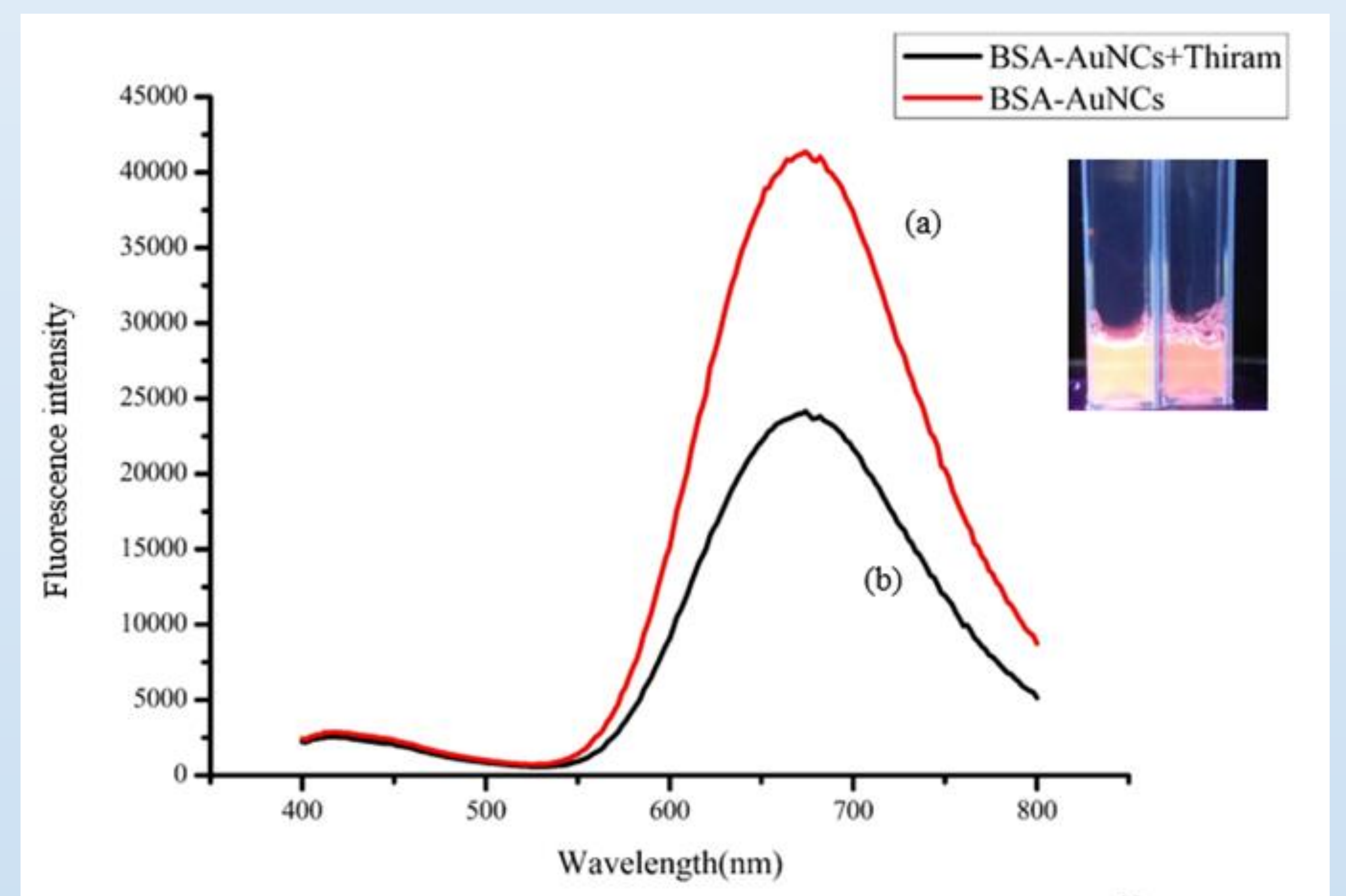


Figure.1 Fluorescence emission spectra of AuNCs (red line) and (b) AuNCs add 10 ppm thiram (black line).

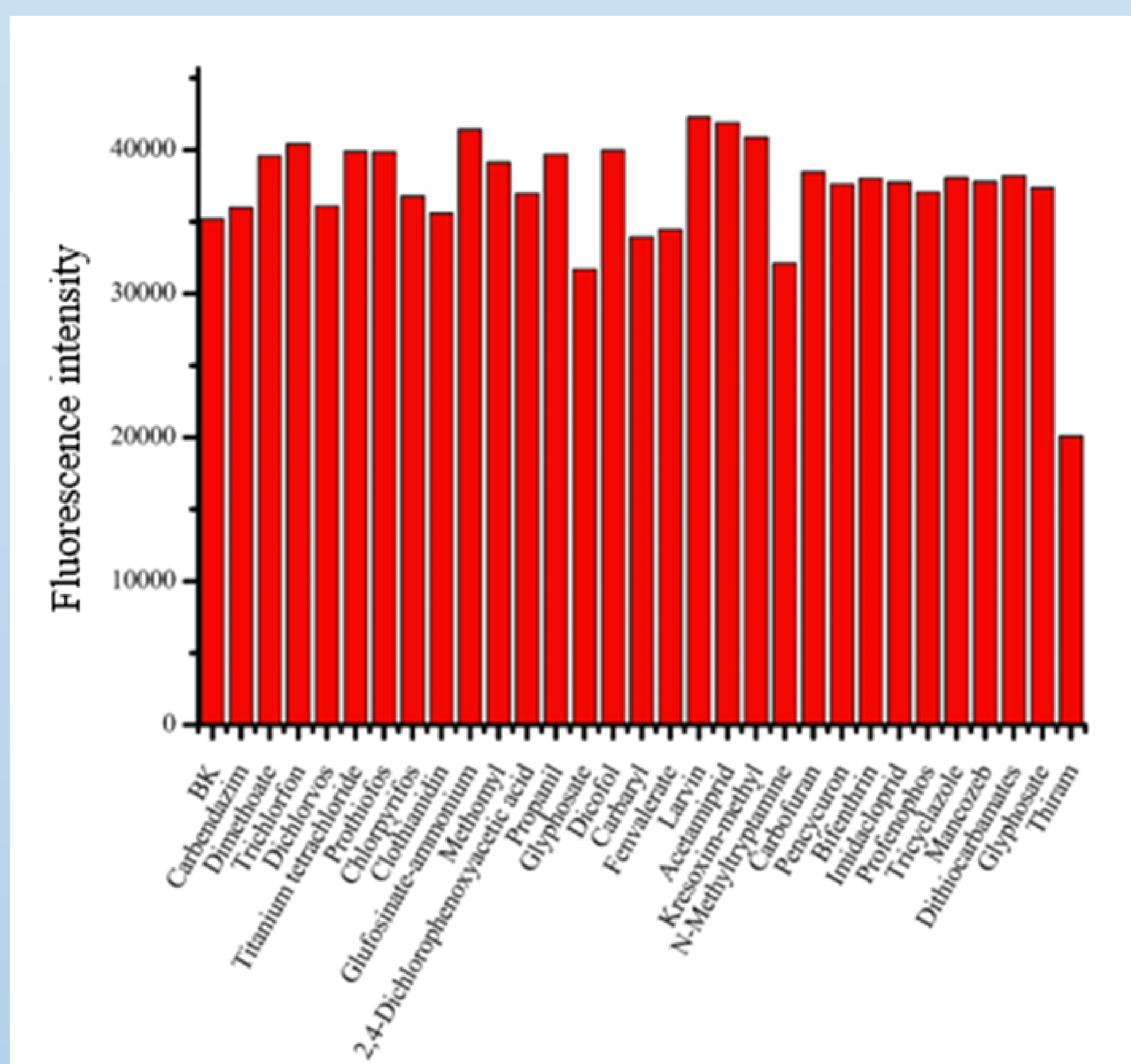


Figure.2 Selectivity of the sensors for thiram over various pesticides. (the concentrations of thiram: 10 ppm , other analytes: 10 ppm.)

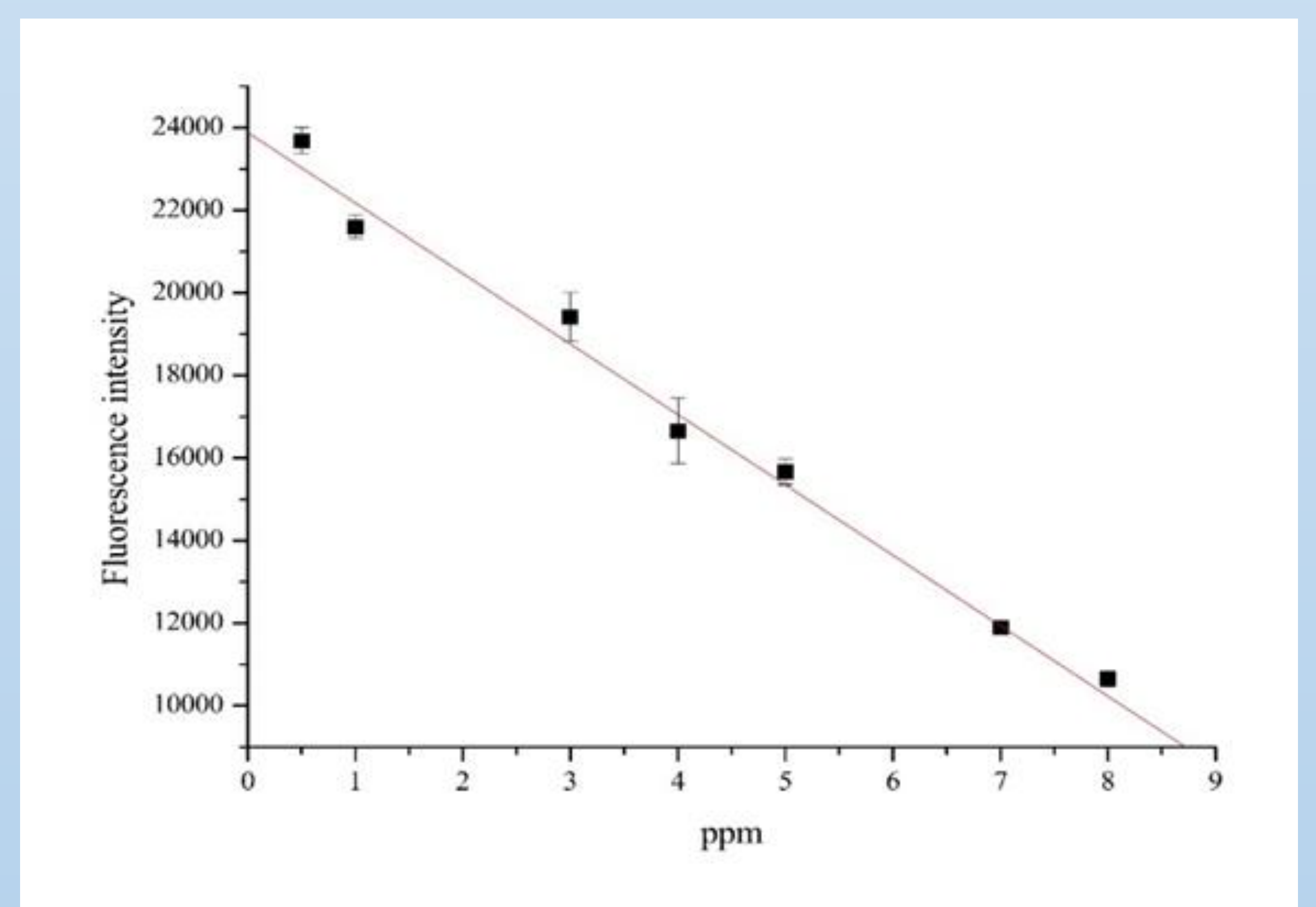


Figure.3 Corresponding plots of Fluorescence intensity at 682 nm upon different concentrations of Thiram. Inset: linear relationship between Fluorescence intensity at 682 nm and Thiram concentration over the range of 8ppm-0.5ppm,  $R^2= 0.992$

Table.2 Recovery test of Thiram spiked in tap water samples

Sample	Add(ppm)	Recovery(%)	RSD(%)
Tap water	3ppm	90.6%	0.52%
		93.0%	
		94.6%	
Tap water	5ppm	98.6%	1.06%
		100.8%	
		102.8%	
Tap water	7ppm	95.7%	2.30%
		97.3%	
		101.2%	

## Conclusion

At pH 6 conditions, BSA-AuNCs produced good selectivity to thiram, resulting in the quenching of the fluorescence through the addition of different concentrations of thiram. the linear relationship ranging from 0.5 ppm to 8 ppm,  $R^2= 0.992$ , and the limit of detection is 0.28ppm. This method was successfully applied to real samples, and the good recovery rate (88.4%-108.7%) was obtained, and the RSD is less than 5.13%. In the future, the method will be applied to the determination of real fruits and vegetables.