

## **Development of surface plasmon resonance sensor for determining zinc ion using novel active nanolayers as probe**

### **Abstract**

In this study, novel active nanolayers in combination with surface plasmon resonance (SPR) system for zinc ion ( $Zn^{2+}$ ) detection has been developed. The gold surface used for the SPR system was modified with the novel developed active nanolayers, i.e. chitosan and chitosan-tetrabutyl thiuram disulfide (chitosan-TBTDS). Both chitosan and chitosan-TBTDS active layers were fabricated on the gold surface by spin coating technique. The system was used to monitor SPR signal for  $Zn^{2+}$  in aqueous media with and without sensitivity enhancement by TBTDS. For both active nanolayers, the shift of resonance angle is directly proportional to the concentration of  $Zn^{2+}$  in aqueous media. The higher shift of resonance angle was obtained for chitosan-TBTDS active nanolayer due to a specific binding of TBTDS with  $Zn^{2+}$ . The chitosan-TBTDS active nanolayer enhanced the sensitivity of detection down to 0.1 mg/l and also induced a selective detection towards  $Zn^{2+}$ .

**Keyword:** Surface plasmon resonance; Zinc ion; Novel active nanolayer; Chitosan; Tetrabutyl thiuram disulfide