

## OPTICAL SENSOR (HEAVY METAL DETECTION BASED ON CHITOSAN)

### TECHNOLOGY DESCRIPTION

The optical sensor of polypyrrole –chitosan (PPy-CHI) was fabricated to monitor toxic metal ions with sensitivity enhancement by chitosan (CHI).

### TECHNOLOGY FEATURES

Chitosan is a biodegradable, biocompatible, non-toxic and low cost biopolymer enhanced the sensitivity of the sensor. This technology enables detections of heavy metal ions at a lower concentration with less interference. The optical sensor is portable and suitable for in situ field monitoring. Operation and handling of the sensor does not require any special knowledge of chemical testing and it is user-friendly. Cost of investment for the surface sensor is low. This device is stable in the sensing area and refreshable.

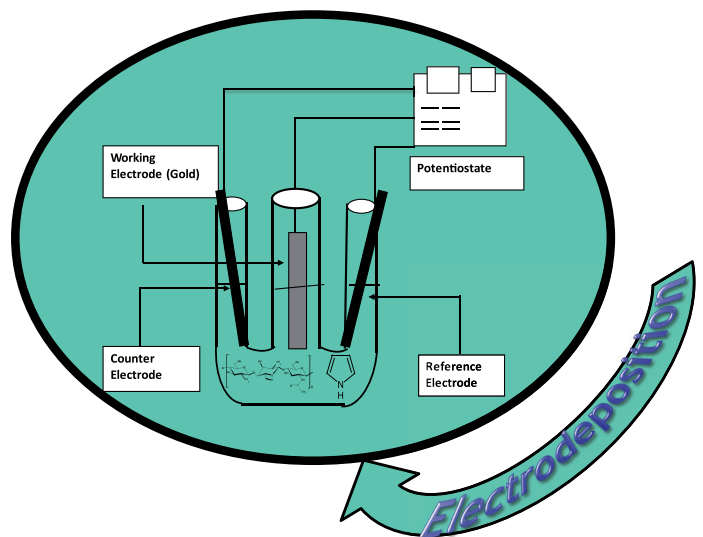
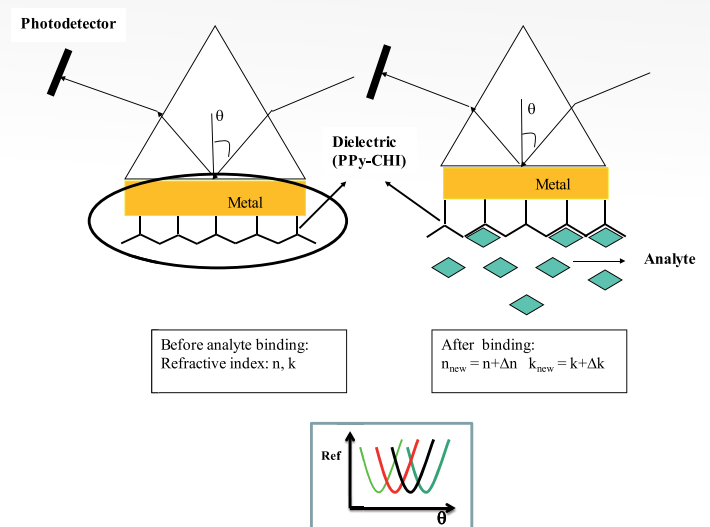
### ADVANTAGES

- Environmental friendly and no harmful reagents are used.
- Non-destructive method
- Small amount of sample required

### INDUSTRY OVERVIEW

#### Main prospect: Metal Industry

This invention focuses on a strategy for using gold nanoparticles capped with chitosan for sensing ions of heavy metals. The market potential includes companies involved in sewage treatment, quality control test, battery manufacturers, pollution monitoring laboratory, waste water treatment system of the factory, and smeltery and metal processing factory. Although in several sectors, the number of companies may be small, the list of SMEs in Malaysia that are involved in metal are 1536 companies in total while another 532 are under chemical petrochemical products. As opposed to the current products in the market, this invention requires a small size set up with an approximate cost of \$1680. Other benefits are that it is non-destructive and environmentally friendly, and portable and suitable for in situ field monitoring. Compared to other similar products, it is also accurate and precise, stable and requires small amount of sample.



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