



Contribution ID: 342

Type: Oral

Pesticide Detection Based on Ion Sensitive Field Effect Transistor

Wednesday, 24 May 2017 14:30 (15 minutes)

Development of pesticide sensor based on the ion sensitive field effect transistor (ISFET) was investigated by using acetylcholinesterase which is an enzyme that catalyzes the hydrolysis of acetylcholine to acetate and choline. The ISFET can measure the inhibition reaction of acetylcholinesterase enzyme by the carbaryl pesticide through the pH changed in solution. The acetylcholinesterase was coated on ISFET's surface by varying the enzyme concentration from 0.01 to 0.5 unit to select the optimum concentration for carbaryl detection. The pH effect of buffer solution was studied in the range of 6-10 to find the suitable pH for enzyme function which provides high sensitivity. The results showed that buffer solution pH 7 was the optimum pH for enzyme reaction and provided a good response for carbaryl detection in the range of 10^{-6} to 10^{-5} M. Moreover, the sensor stability was tested by comparison of the detection signal from ISFET that were kept at the different time.

Primary author: Mr SASIPONGPANA, Supanat (College of Nanotechnology, King Mongkut's Institute of Technology Ladkrabang, Bangkok, 10520 Thailand)

Co-authors: Dr HOUNGKAMHANG, Nongluck (College of Nanotechnology, King Mongkut's Institute of Technology Ladkrabang, Bangkok, 10520 Thailand); Dr RAYANASUKHA, Yossawat (National Nanotechnology Center, PathumThani, Thailand); Dr THANACHAYANONT, Chanchana (National Metal and Materials Technology Center, PathumThani, Thailand); Prof. NUKEAW, Jiti (College of Nanotechnology, King Mongkut's Institute of Technology Ladkrabang, Bangkok, 10520 Thailand); Dr PRICHANONT, Seeroong (Department of Chemical Engineering, Chulalongkorn University, Bangkok, Thailand); Dr PRATONTEP, Sirapat (College of Nanotechnology, King Mongkut's Institute of Technology Ladkrabang, Bangkok, 10520 Thailand); Dr PORNTHEERAPAT, Supanit (National Electronics and Computer Technology Center, Pathumthani 12120, Thailand); Dr BUNJONGPRU, Win (Thai Microelectronics Center, Chachoengsao, 24000 Thailand); Dr JEAMSAKSIRI, Wutthinan (Thai Microelectronics Center, Chachoengsao, 24000 Thailand)

Presenter: Mr SASIPONGPANA, Supanat (College of Nanotechnology, King Mongkut's Institute of Technology Ladkrabang, Bangkok, 10520 Thailand)

Session Classification: A1: Biological

Track Classification: Biological Physics and Biomedical Engineering