



SP3.05

A Chemical Sensor from Polyaniline-Sulfonated Polystyrene Composite

*Somboon Sahasithiwat, Thanyarat Techalertmanee

*National Metal and Materials Technology Center,
114 Thailand Science Park, Paholyothin Rd., Pathumthani, Thailand*

Polyaniline was synthesized using sulfonated polystyrene as a template at various mole ratios. The composites were easier to fabricate than the sole polyaniline due to the hydrophilic part in sulfonated polystyrene. The composites can stabilize in water as a submicron size colloidal. An x-ray diffractogram of the composites powder showed that polyaniline in the composites was in a semicrystalline form. A chemical sensor was fabricated by spin-coating the composite film onto an interdigitated electrode. The sensors were tested with various solvents. When the sensors were exposed to a chemical vapor, their conductivities were increased and were recovered to their baseline when a chemical vapor was removed. It was also found that the sensor responses were linearly to concentrations of polar solvents such as ethanol and water. On the other hand, the responses were not linear to concentrations of nonpolar solvents such as hexane. The response of the sensor was different from that of sensor fabricated from a composite of an electrical inert polymer-carbon black in which its conductivity decreased when exposed to a chemical vapor. The role of sulfonated polystyrene in the composite of polyaniline-sulfonated polystyrene on a chemical sensing mechanism will be discussed.