

Nitikorn Chuekuna 2010: Studies of an Intercalation Compound in Bentonite to Prepare Film for Dissolved Oxygen Measurement. Master of Science (Chemistry), Major Field: Chemistry, Department of Chemistry. Thesis Advisor: Associate Professor Ladda Meesuk, Ph.D. 70 pages.

In this research, an intercalation compound [Zn(8-hydroxyquinoline)<sub>2</sub>] or Znq<sub>2</sub> was prepared by the *in situ* solid-solid reaction of 8-hydroxyquinoline and Zn(II) in the interlayer space of Ca-bentonite. The intercalation of Znq<sub>2</sub> in bentonite and the complex formation between Zn(II) and 8-hydroxyquinoline in bentonite were confirmed by powder X-ray diffraction, elemental (C,N) analysis, thermogravimetric analysis and fourier transform infrared spectroscopy.

The study of fluorescence property showed that Znq<sub>2</sub>-bentonite gave good fluorescence intensity at around 503 nanometer when excited by 420 nanometer light.

To fabricate a sensor film for dissolved oxygen (DO) measurement, Znq<sub>2</sub>-bentonite was dispersed in 2 different polymers, polystyrene in toluene and KE200: CX200 silicone and coated on a polystyrene substrate. Both sensor films responded to dissolved oxygen by fluorescence quenching process giving linear Stern-Volmer plots up to 60% DO. The KE200: CX200 silicone polymer immobilized Znq<sub>2</sub>-bentonite sensor film showed sensitivities better than polystyrene immobilized Znq<sub>2</sub>-bentonite. In addition, the use of KE200: CX200 silicone polymer immobilized Znq<sub>2</sub>-bentonite sensor film showed the effect of water temperature on the fluorescence intensities. The sensitivity of sensor decreased as the water temperature increased which can be classified to the static quenching.

This is the first time that an intercalation compound in bentonite is used to fabricate a film to measure dissolved oxygen in water. No other report was found on this application.

---

Student's signature

---

Thesis Advisor's signature