

Luminescence Properties of Platinum Porphyrin Embedded in Multilayered Polymer Nanosheets

Masaya MITSUISHI, Tao CHEN, Yu GAO and Tokuji MIYASHITA

Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, 2-1-1 Katahira, Aoba-ku,
Sendai 980-8577, Japan

E-mail : masaya@tagen.tohoku.ac.jp

The paper presents luminescence properties of platinum porphyrins embedded in ultrathin polymer Langmuir-Blodgett (LB) films (nanosheets). We prepared amphiphilic copolymer of platinum porphyrin with *N*-dodecylacrylamide (p(DDA/PtTPP)). The copolymer p(DDA/PtTPP) with 6mol% PtTPP content took a stable monolayer formation at the air-water interface. Luminescent p(DDA/PtTPP) nanosheets were successfully assembled on solid substrates by the vertical dipping method. The luminescence intensity as a function of the number of layers revealed that platinum-porphyrin is effectively quenched by molecular oxygen for multilayered p(DDA/PtTPP) nanosheets with more than ten layers. Atomic force microscopy revealed that the p(DDA/PtTPP) nanosheets had relatively rough surfaces, leading to high surface-to-volume ratio. The oxygen sensitive polymer nanosheet multilayers enables us to monitor dissolved oxygen concentration in water.

Key Words : Luminescence, Langmuir-Blodgett, Platinum porphyrin, Nanosheet