T2R2 東京工業大学リサーチリポジトリ Tokyo Tech Research Repository

## 論文 / 著書情報 Article / Book Information

| 題目(和文)            | OLED照明向けZinc Silicate電子注入/輸送層薄膜   |
|-------------------|---|
| Title(English)    | Zinc Silicate Thin Films for the Electron Injection/Transport Layer of OLED Lighting Devices  |
| 著者(和文)            | 中村伸宏  |
| Author(English)   | Nobuhiro Nakamura   |
| 出典(和文)            | 学位:博士(工学),<br>学位授与機関:東京工業大学,<br>報告番号:甲第10697号,<br>授与年月日:2017年12月31日,<br>学位の種別:課程博士,<br>審査員:細野 秀雄,真島 豊,神谷 利夫,平松 秀典,大見 俊一郎  |
| Citation(English) | Degree:Doctor (Engineering),<br>Conferring organization: Tokyo Institute of Technology,<br>Report number:甲第10697号,<br>Conferred date:2017/12/31,<br>Degree Type:Course doctor,<br>Examiner:,,,, |
| 学位種別(和文)          | 博士論文  |
| Category(English) | Doctoral Thesis   |
| 種別(和文)            |   |
| Type(English)     | Outline   |

To realize OLEDs for lighting with high out-coupling efficiency and reliability, properties of zinc silicate were elucidated, and OLEDs with very thick zinc silicate film as electron injection and transport layer fabricated on the originally developed scattering layer with high refractive index glass matrix were evaluated. It was revealed that the zinc silicate films consist of aggregates of nanoscale ZnO crystals and areas of a-ZnO-SiO<sub>2</sub>, and this structure: zinc oxide nanocrystals isolated by thin a-ZnO-SiO<sub>2</sub> governs exceptional properties: low work function, higher mobility etc. OLEDs with very thick zinc silicate film and the scattering layer keeps the high out-coupling efficiency (×1.7), and the leak current can be suppressed. This indicates that OLEDs for lighting with high out-coupling efficiency and reliability will be obtained by these technologies.