

Hydrophobic treatment of B5 phosphor using DBD plasma at atmospheric pressure with Hexamethyldisiloxane (HMDSO) and HMDSO/Toluene mixture as gaseous precursors

조진오, Trinh Quang Hung, 목영선*, 장두일, 이상백
제주대학교
(smokie@jejunu.ac.kr*)

In order to improve the hydrophobicity and the stability of photoluminescence phosphors under effects of environmental conditions, stable hydrophobic coatings were successfully deposited on commercial PA602A1 orange phosphor using atmospheric DBD plasma with hexamethyldisiloxane (HMDSO) and HMDSO/toluene mixture as precursors. The characteristics of the thin films were analyzed employing various techniques. The change in surface free energy (SFE) showed a conversion from hydrophilic to super-hydrophobic state. Moreover, the reevaluation showed a significant increase in water contact angle for the aged samples compared to just after treatment ones. Through PL analysis, the photoluminescence intensity not only did not decline (except sample of 10 minutes treatment) but also went up compared to the bare or reference phosphor sample. The coatings containing non-polar functional groups such as CH₃, CH₂ were realized by FTIR analysis. Besides, there was no considerable change in results of XRD analysis.

* 본 연구는 교육과학기술부와 한국연구재단의 기술혁신인력양성사업(과제번호:07-002)의 지원에 의해 이루어진 것임.