

초음파 분무 열분해 방법을 적용한 Alkaline Earth Selenide 형광체 제조 및 LED 적용

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In this study, Eu^{2+} activated $\text{Sr}_{1-x}\text{Ca}_x\text{Se}$ alkaline earth selenide phosphors were obtained by ultrasonic spray pyrolysis. The spray solutions were prepared using $\text{Sr}(\text{NO}_3)_2$, $\text{Ca}(\text{NO}_3)_2$, SeO_2 (Aldrich, 99.999%), and $\text{Eu}(\text{NO}_3)_3 \cdot 5\text{H}_2\text{O}$ dissolved in D.I water with 0.1M of total concentration. The formation of particles was occurred at 650°C , and collected particles were sintered at 950°C for 4hr under H/N (5/95) reduction atmosphere. The prepared $\text{Sr}_{1-x}\text{Ca}_x\text{Se}:\text{Eu}^{2+}$ exhibited the uniform spherical shape with the submicron about 800–900nm in diameter. The $\text{Sr}_{1-x}\text{Ca}_x\text{Se}:\text{Eu}^{2+}$ maintained cubic structure regardless of Sr:Ca ratio, however, the emission band was changed from 561 to 607nm with increasing Ca^{2+} ratio. The detailed structural and luminous properties were investigated by SEM, XRD, and Photoluminescence (PL). The white LED was fabricated by combining 460nm LED chip with prepared alkaline earth selenide. The characteritic of white LED was analyzed by measuring luminous efficacy, CRI, CCT, and CIE.