

## 휴리스틱스기법과 조합화학을 이용한 신조성 형광체 탐색

손기선<sup>†</sup>

순천대 나노신소재  
(kssohn@sunchon.ac.kr<sup>†</sup>)

In an attempt to search for new promising phosphors for use in LEDs, a solution based combinatorial chemistry method involving high throughput synthesis and characterization has been employed. Besides this conventional combinatorial chemistry, a more advanced screening strategy, which hybridizes combinatorial chemistry and computational optimization such as genetic algorithm, was employed. Multi-objective genetic algorithm was also employed to pursue both the optimization of materials property of concern and the minimization of experiment inconsistency, which has been known as one of the most problematic drawback of combinatorial material science. Quantitative structure activity relationship (QSAR) modeling was also employed to make the results from the combinatorial screening more understandable.

**Keywords:** combinatorial screening, genetic algorithm

## Pulse 구동에서의 LED 패키지의 열적 거동 및 특성 분석

신무환<sup>†</sup>

명지대학교 신소재공학과  
(mwshin@mju.ac.kr<sup>†</sup>)

In this paper, thermal evaluation of high power LEDs under the pulse driving conditions are presented. A theoretical model based on the analogy between the thermal and electrical RC circuits. The thermal performance of LED packages driven by pulse input was calculated using the RC network extracted from the transient thermal measurement. The junction temperature fluctuation band decreases with the frequency at certain duty cycles. The saturated average junction temperature rise linearly increases with the duty cycle at certain range of frequencies. The predictions were verified by the real time junction temperature measurement using the peak shift method at pulse conditions. The theoretical model was found to be very useful and applicable to the evaluation of the thermal performance of LEDs driven at the wide range of pulse conditions.

**Keywords:** LED, 열특성, Pulse구동