

Development of a semiconductor white light source with a high color rendering index

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The paper presents the results of developing a semiconductor white light source characterized by a neutral color temperature and a high color rendering index. The white light source comprises two LED heterostructure crystals based on GaN, emitting blue and green light, which are housed in a common metal-polymer casing and coated with a phosphor composition containing red and yellow phosphors. The study demonstrates that optimizing the ratio of red to yellow phosphors, as well as the binding silicone, enables the achievement of a high color rendering index while maintaining the desired color temperature. Specifically, the formulation consisting of 9 % yellow phosphor, 1 % red phosphor, and 90 % silicone filler in the phosphor-composition resulted in a color temperature of 4500 K for the dual-crystal light source, along with a color rendering index of 94.

Keywords: semiconductor white light source; LED; phosphor composition.

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