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Daylight in the x, y Chromaticity Diagram; 2.4 LED Specific Spectral and Colorimetric Quantities; 2.4.1 Peak Wavelength (P); 2.4.2 Spectral Bandwidth at Half Intensity Level (0.5); 2.4.3 Centroid Wavelength (C); 2.4.4 Colorimetric Quantities Derived from the Spectral Radiance Distribution of the LED Light Source; 2.4.4.1 Dominant Wavelength (D); 2.4.4.2 Colorimetric Purity (pC); 2.5 Circadian Effect of Electromagnetic Radiation
2.5.1 The Human Circadian Clock References; Chapter 3 LED Components - Principles of Radiation Generation and Packaging; 3.1 Introduction to LED Technology; 3.2 Basic Knowledge on Color Semiconductor LEDs; 3.2.1 Injection Luminescence; 3.2.2 Homo-Junction, Hetero-Junction, and Quantum Well; 3.2.2.1 Homo-Junction; 3.2.2.2 Hetero-Junction; 3.2.2.3 Quantum Well; 3.2.3 Recombination; 3.2.3.1 Direct and Indirect Recombination; 3.2.3.2 Radiative and Nonradiative Recombinations and Their Simple Theoretical Quantification; 3.2.4 Efficiency; 3.2.4.1 Internal Quantum Efficiency (i) 3.2.4.2 Injection Efficiency (inj) 3.2.4.3 Light Extraction Efficiency (extraction); 3.2.4.4 External Quantum Efficiency (ext); 3.2.4.5 Radiant Efficiency (e, See Section 2.2.5, Eq. (2.13)); 3.2.4.6 Luminous Efficacy (v); 3.2.5 Semiconductor Material Systems - Efficiency, Possibilities, and Limits; 3.2.5.1 Possible Semiconductor Systems; 3.2.5.2 Semiconductor Systems for Amber-Red Semiconductor LEDs; 3.2.5.3 Semiconductor Systems for UV-Blue-Green Semiconductor LEDs; 3.2.5.4 The Green Efficiency Gap of Color Semiconductor LEDs; 3.3 Color Semiconductor LEDs
3.3.1 Concepts of Matter Waves of de Broglie

Sommario/riassunto

Promoting the design, application and evaluation of visually and electrically effective LED light sources and luminaires for general indoor lighting as well as outdoor and vehicle lighting, this book combines the knowledge of LED lighting technology with human perceptual aspects for lighting scientists and engineers. After an introduction to the human visual system and current radiometry, photometry and color science, the basics of LED chip and phosphor technology are described followed by specific issues of LED radiometry and the optical, thermal and electric modeling of LEDs. This is supplement