

1. Record Nr.	UNINA9910829981903321
Titolo	Luminescence [[electronic resource]] : from theory to applications // edited by Cees Ronda
Pubbl/distr/stampa	Weinheim, : Wiley-VCH, c2008
ISBN	1-281-31180-4 9786611311803 3-527-62106-7 3-527-62105-9
Descrizione fisica	1 online resource (278 p.)
Classificazione	35.25 33.77
Altri autori (Persone)	RondaC. R
Disciplina	535.35
Soggetti	Luminescence Phosphors
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Luminescence; Foreword; Contents; Preface; List of Contributors; 1 Emission and Excitation Mechanisms of Phosphors; 1.1 Introduction; 1.2 General Considerations - Fluorescent Lamps; 1.3 General Considerations - Cathode Ray Tubes; 1.4 Luminescence Mechanisms; 1.4.1 Center Luminescence; 1.4.2 Charge Transfer Luminescence; 1.4.3 Donor Acceptor Pair Luminescence; 1.4.4 Long Afterglow Phosphors; 1.5 Excitation Mechanisms; 1.5.1 Optical Excitation of Luminescence and Energy Transfer; 1.6 Energy Transfer Mechanisms Between Optical Centers; 1.6.1 Mechanisms Underlying Energy Transfer 1.6.2 Energy Transfer Governed by Electrostatic Interaction1.6.3 Energy Transfer by Higher-order Coulomb Interaction; 1.6.4 Energy Transfer Governed by Exchange Interactions; 1.6.5 Cross-relaxation and Energy Transfer; 1.6.6 Practical Implications; 1.7 Excitation with High-energy Particles; 1.8 Electroluminescence (EL); 1.8.1 High-voltage Electroluminescence; 1.8.2 Low-voltage Electroluminescence; 1.9 Factors Determining the Emission Color; 1.10 Energy Efficiency Considerations of Important Luminescent Devices; 1.11 Luminescence Quantum Yield and Quenching Processes

1.11.1 The Energy does not Reach the Luminescent Ion
 1.11.2 The Absorbed Energy Reaches the Luminescent Ion but there are Nonradiative Channels to the Ground State;
 1.11.3 The Luminescence Generated is Absorbed by the Luminescent Material;
 1.12 Acknowledgement;
 2 Quantum Dots and Nanophosphors;
 2.1 Introduction;
 2.1.1 Optical Properties of Quantum Dots;
 2.1.2 Particle in a One-dimensional Potential Well;
 2.1.3 Particle in Three-dimensional Potentials;
 2.1.3.1 Particle in a General Three-dimensional Potential;
 2.1.3.2 Electron in a Coulomb Potential;
 2.1.3.3 The Hydrogen Atom
 2.2 Density of States in Low-dimensional Structures
 2.3 Electrons, Holes, and Excitons;
 2.4 Low-dimensional Structures;
 2.4.1 The Weak Confinement Regime;
 2.4.2 The Strong Confinement Regime;
 2.5 Quantum Confinement in Action;
 2.6 Photoluminescence of Quantum Dots Prepared by Wet-chemical Precipitation;
 2.7 Photoluminescence from Doped Quantum Dots;
 2.8 Luminescence of Nano Particles of Rare-Earth Phosphors;
 2.9 Nanoscale Particles for Molecular Imaging;
 2.10 Conclusions;
 2.11 Acknowledgements;
 3 Phosphors for Plasma Display Panels;
 3.1 Introduction
 3.2 Principle of Operation of Plasma Display Panels
 3.3 Performance of Applied Phosphors in PDPs;
 3.3.1 Phosphor Efficiency;
 3.3.2 Electronic Transitions Involved in Europium Luminescence;
 3.3.3 Color point and efficiency of the red phosphors;
 3.3.4 Stability and Color Point of BaMgAl(10)O(17):Eu;
 3.4 Summary and Prospects;
 4 Quantum-Splitting Systems;
 4.1 Introduction;
 4.2 Quantum-splitting Phosphors Based on Pr(3+)-activated Fluoride Materials;
 4.3 Quantum-splitting Phosphors Based on Pr(3+)-activated Oxide Materials;
 4.3.1 SrAl(12)O(19): Pr(3+)
 4.3.1.1 LaMgB(5)O(10) and LaB(3)O(6) Doped with Pr(3+)

Sommario/riassunto

In this, the only up-to-date book on this key technology, the number-one expert in the field perfectly blends academic knowledge and industrial applications. Adopting a didactical approach, Professor Ronda discusses all the underlying principles, such that both researchers as well as beginners in the field will profit from this book. The focus is on the inorganic side and the phenomena of luminescence behind the manifold applications illustrated here, including displays, LEDs, lamps, and medical applications. Valuable reading for chemists and electrochemists, as well as materials scientist
