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Short Course SC003

Luminescence of Inorganic Compounds, Fundamentals and Applications

Prof. Dr. Cees Ronda

Philips Group Innovation-Research, Eindhoven, the Netherlands,
Zhejiang University, Hangzhou, China

Tuition Fee: (USD 150)

Course Objective:

In this short course, fundamentals and applications of inorganic luminescent materials will be dealt with. Starting at a fundamental level, the relevant theoretical background and spectroscopic tools will be treated. The course will end with a session on applications.

Who Should Attend:

The half day short course is designed for people entering this field, and also for people that want to refresh their knowledge in this rapidly developing area. The course will also be very interesting for managers, steering this kind of research.

Course Outline:

1. Luminescence fundamentals
2. Description of electronic states of transition metal ions and rare earth ions
3. Absorption and emission mechanisms
4. Spectroscopic tools
5. Applications

PART I. Luminescence fundamentals

In this part, first the topic of luminescence will be introduced, using numerous examples from different application areas. Thereafter, term symbols will be derived enabling a general description of the electronic states involved in absorption- and emission processes. In this part, also optical selection rules will be introduced and discussed. The next part deals with mechanisms that generate luminescence and also mechanisms used to excite luminescence. It will be shown how different applications require different material properties and how the fundamentals treated before can be used to deal with this.

Part II. Characterization and applications

In the second part of the course first instrumentation will be dealt with. Clear relations will be established between spectroscopic tools and the information that can be derived using them. The course will end by reviewing a number of applications elucidating the close relation between material properties and device operation.

Instructor(s) Biography:

Cees Ronda, Professor, Ph.D., is a Research Fellow at the Philips Group Innovation Research Center in Eindhoven, the Netherlands. He also is associate Professor at Zhejiang University in Hangzhou, China and Fellow of Eindhoven Technical University. He has a background in optical materials.

The work of Ronda has contributed to many different Philips product families, such as fluorescent lamps, LEDs, medical imaging equipment and also to 'my reading light'. Recently, the scope of his interest has widened to sensors and air purification.

Ronda has more than 50 US patents and more than 70 peer reviewed publications. He also edited and contributed to a book on Luminescence (Luminescence: from theory to applications, VCH, 2007) and a next book is in preparation.

In 2005, he has been awarded the 'Pannenberg' award in view of his important contributions to Philips Research.

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