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Preface

The Fourth International Conference on f-Elements, ICFE-4, was held September 17–21, 2000 at the Conference Hall of the Universidad Complutense of Madrid, Spain. This ICFE-4 is a continuation of the series organized by the European Rare Earths and Actinides Society (ERES), after Leuven (ICFE-1, 1990), Helsinki (ICFE-2, 1994), Paris (ICFE-3, 1997) and before Geneva scheduled in 2003. These broad scope conferences are devoted to science and technology of f-elements. The programme covers different topics related to the synthesis and properties of novel compounds with applications in fields such as electronics, optics, lasers, magnetism, catalysis, medicine, etc. The Conference was organized in the following twelve symposia, each of them with oral and poster sessions: (a) synthesis, structure and defects (b) coordination and organometallic chemistry (c) optical materials (d) magnetic properties and magnetic materials (e) ionic conductivity and solid electrolytes (f) superconductors (h) catalysis (i) electronic properties (j) spectroscopies (k) biomedical applications (l) f-elements in geology and environment (m) session in memory of Prof. Clyde Morrison.

Highlighting the programme was the presentation of the first ERES award for young researchers in rare earths and actinides as well as the P.-E. LeCoq de Boisbaudran award to an outstanding senior scientist generously sponsored by Rhodia Terres Rares.

ICFE-4 was attended by 350 scientists representing 30 countries, more than half of the attendees came from countries outside the European Community. The Conference featured 5 Plenary lectures by C. Vettier (France), A. Kaminskii (Russia), A. Trovarelli (Italy), X. Obradors (Spain) and J.-C. Bünzli (Switzerland), 18 Invited lectures, 70 oral presentations and 341 poster contributions.

The proceedings of the ICFE-4 are being published as regular issues of the Journal of Alloys and Compounds. All papers that appear in these proceedings have been reviewed by two outstanding scientists in their respective research fields, following the standards of the Editorial Board of the Journal. The papers have been grouped according to the Conference sessions with both oral and posters presentations grouped by topics. These Proceedings represent about sixty per cent of the registered abstracts,

scientists who are interested in abstracts from the other contributions are referred to the Abstract Booklet.

The support received from the industry and official organisations has been essential for the ICFE-4 conference. We are particularly grateful to the Spanish Ministry of Education, Universidad Complutense of Madrid, Universidad Autónoma of Madrid, Consejo Superior Investigaciones Científicas, Spanish Solid State Chemistry Group, European Rare Earths and Actinides Society and Rhodia Terres Rares, our main sponsor. Additional support is gratefully acknowledged. Carburros Metálicos, Jeol Europa, Bruker and Optilas.

Finally, the success of ICFE-4 is highly indebted to the efforts of a large number of colleagues who contributed with their time and expertise to planning this Conference. The Chairman and the Guest Editors would like to take this opportunity to thank the International Advisory Committee, the Organizing Committee, the Chairs of the sessions as well as the reviewers (and authors) who generously spend a lot of time to make a successful Conference.

Professor Regino Sáez Puche
Chairman ICFE-4-Guest Editor
Dr. Alicia de Andrés and
Professor Jean-Claude Bünzli
Guest Editors

Award ceremony

For the first time since its creation, the European Rare Earths and Actinide Society (ERES) has granted two awards during the 4th International Conference of f-Elements held in Madrid, September 17–21, 2001. The Lecoq de Boisbaudran Senior Award is sponsored by Rhodia Rare Earths and is given for outstanding and long-lasting contribution to the science and/or technology of the f-elements. The Junior award is subsidised by ERES and is given for an innovative contribution to the science and/or technology of the f-elements. François Lecoq de Boisbaudran was born in Cognac on April 18, 1838 and died on May 28, 1912. He was a skilled experimentalist who met

success combining rigor and challenging ideas. His achievements are remarkable, taking into account that he worked alone and part time! He discovered gallium (1876), samarium (1879) and dysprosium (1886).

Paul Caro, 1st recipient of the Lecoq de Boisbaudran Award

Solid state chemist and spectroscopist, Paul Caro has been chosen as the first winner of the Lecoq de Boisbaudran award in regard of his thoughtful and innovative contributions to the field of rare earths. His PhD thesis (1962) was concerned with the identification of the various phases of Y-Mg using electron microprobe, a very new analytical tool at that time. He then turned to the study of ternary diagrams involving rare earth oxides, carbonate and water, before moving to Arizona State University where he worked with L. Eyring and J. Corbett on non stoichiometric phases of rare earth oxides and on chlorides.



Back to France in 1967, he was appointed vice-director of the 'Laboratoire des Terres Rares' in Bellevue near Paris in 1969 where he started a systematic study of rare earth absorption spectra and, later, emission spectra, together with a theoretical interpretation based on crystal field calculations. He also developed thin film chemistry and analysis by means of electron microscopy. Paul Caro is the author of a book on the electronic structure of transition metal elements (1976) and he has authored or co-authored more than 300 scientific papers. In addition to his scientific career, Paul Caro has always devoted much attention to science dissemination both among scientists and to a large non-specialist audience. He is a corresponding member of the French Academy of Sciences since 1978 and a member of several editorial boards (including the Handbook on the Physics and Chemistry of Rare Earths). He was a co-founder of ERES and since 1989, he moved to the 'Cité des Sciences' in Paris where

he acted as scientific councilor. Presently, he is in charge of the communication at the CNRS.

Paul Caro is a very humanitarian personality and his way of thinking and of discovering and solving interesting problems is very similar to the attitude of Lecoq de Boisbaudran.

Koen Binnemans, 1st recipient of the ERES Junior Award

Dr Koen Binnemans from the Katholieke Universiteit Leuven was awarded the first ERES Junior Award for his outstanding achievements in research during his short career (60 papers published to date). He was born in Geel in 1970 and earned a 'licentiate' (1992) and a PhD (1996) in inorganic and analytical chemistry from K.U. Leuven, both with *summa cum laude*. His PhD work, performed under the supervision of Prof. Christiane Görrler-Walrand was devoted to the coordination effects in rare earth spectra. Dr Binnemans visited several universities during and after his PhD work, the University of Hannover (January–April 1992), the University of Rennes (September–November 1996), and the University of Exeter (March–May 1997, October 1997, June 1998 and September 1998). He received several awards, including the Youth Prize of the Flemish Chemical Society (1992), the DSM award for Chemistry and Technology (1996), and in 1999 he was selected as one of the laureates of the Belgian Academy of Sciences.



His scientific work first focused on crystal field analysis of absorption, emission and magnetic circular dichroism spectra of rare earth co-ordination compounds. He is the co-author of two chapters in the Handbook on the Physics and Chemistry of Rare Earths: chapter 155 (Vol. 23) devoted to the rationalization of crystal field parameterization, and chapter 167 (Vol. 25) dealing with spectral intensities of f-f transitions. More recently, he became interested in lanthanide-containing liquid crystals and has already published more than a dozen papers in the field,

between 1999 and 2000, including one in the Journal of the American Chemical Society. There is no doubt that Dr Koen Binnemans will be one of the leading rare earth coordination chemists in the 21st century.

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