

Lanthanides and Actinides in Molecular Magnetism

This book edited by Richard Layfield and Muralee Murugesu provides a welcome assembly encapsulated within 10 chapters of insights contributed from experts who work in the area of 4f and 5f systems showing exotic magnetic properties. Since chemists have now recognized that compounds with open f-shells might be much more interesting than suggested by the older literature in terms of their electronic structures, there has been a speedy development of 4f coordination and organometallic chemistry along with increased efforts in 5f chemistry. Interest in 5f chemistry is partly fueled by the idea that 5f frontier orbitals should somehow provide compounds more akin to the familiar territory of ligand-field-dominated coordination chemistry. There is a single chapter of this book dedicated to the advances in 5f chemistry and this provides an exciting epilogue to the material on 4f compounds presented in the first nine chapters, by giving us indications of the insights to be gained in terms of understanding electronic structures through the study of 5f compounds compared with their 4f counterparts.

The majority of the book is, however, dedicated to charting the progress and describing the current state-of-the-art in 4f molecular magnetism. The contributing authors are recognized as amongst the leaders in the field and have all provided very helpful individual insights into all aspects of 4f chemistry covering methods of synthesis, types of system which are accessible, measurement of physical properties, background theory, and description of electronic structure using highly developed methods in computational chemistry.

The uninitiated reader is advised to ignore the order of the chapters in the book since the very first chapter probably requires more background knowledge regarding the exotic electronic properties of 4f systems than the average coordination chemistry audience will possess. This chapter is actually extremely informative, but I would have preferred to have an opening chapter written by the editors (in addition to or instead of the preface) where they describe the scope and content of the book in a user-friendly way and this would include an allusion as to why the description of electronic structure becomes so tricky in this area of the periodic table—in other words: a scene-setting chapter to start with. I also got the feeling on reading through the whole book that there could have been more editorial coordination, so that the resulting volume could be more of an overarching concept book rather than a collection of contributions with no real thread connecting these.

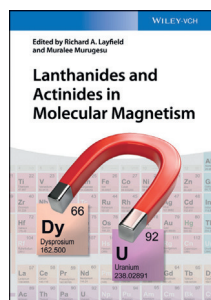
Having said this, I still applaud the publication of this book, which really does bring the views of experts together in terms of f-based magnetochemistry and will be a very useful source for researchers venturing into this field. I sincerely hope that there will be further editions which can improve on the coherence of the book and make it into a treasured standard for those working at the frontiers of f-chemistry. I am certainly very pleased to have this book in my possession and can recommend it.

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