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Asish K. Kundu

Magnetic Perovskites

Synthesis, Structure and Physical Properties

 Springer

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*Dedicated to Profs. C.N.R. Rao
and B. Raveau*

Preface

The field of magnetic perovskites is attracting increasing importance from the condensed matter physicists and materials science community in the last few years because of their potential applications in storage and sensing/actuating devices. This book demonstrates the experimental results on the magnetic, electronic, and multiferroic properties of manganese, iron, cobalt, nickel, and bismuth centered rare earth perovskites. It is organized into four chapters. Chapter 1 provides a brief introduction of various interesting phenomena in magnetic perovskites, e.g., colossal magnetoresistance, electronic phase separation, and multiferroic properties of the general formula ABO_3 .

Chapter 2 describes the results of the investigations on electronic phase separation and glassy ferromagnetism of the hole-doped perovskite manganites and cobaltites. Measurements of magnetic and electron transport properties have been discussed for different types of perovskites. The various aspects studied include the effects of A-site cation radius and the novel effects of cation size disorder. Similarly, the ordered and disordered effects in perovskite structure and related aspects in hole-doped perovskite cobaltites are described in Chap. 3.

Finally, in Chap. 4 we have discussed the bismuth based (ferro-)magnetic perovskite, which shows multifunctional behavior. As for the present trends toward device miniaturization and high-quality data storage, an integration of multifunction into one material system has become highly desirable. The various multiferroics discussed in this book represent one such type of perovskite materials, which do offer the opportunity for humans to develop an efficient control of magnetization and/or polarization by electric field and/or magnetic field, as represented in Chaps. 2 and 3, and to explore their multi-implications.

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