

BOOK REVIEW

Magnetic Hysteresis in Novel Magnetic Materials G.C. Hadjipanayis (Ed.). NATO ASI Series E: Applied Sciences, vol. 338. Kluwer Academic Publishers, Dordrecht, The Netherlands 1997, 905pp, Dfl. 695.00, US\$410.00, GBP 250.00.

This book contains the proceedings of the NATO Advanced Study Institute held in Greece in 1996. The book is divided into four sections representing the following topics: (1) theory, (2) characterisation techniques, (3) novel materials and properties, and (4) applications.

Contributions cover such diverse areas of research as hard and soft magnetic materials, small particles, thin films, bulk magnets and magnet applications, and the past, current and future state of novel magnetic materials, with emphasis on magnetic hysteresis.

Numerous contributions will be of particular interest to most readers of this journal. The paper “Interaction effects in fine particle systems” by R.W. Chantrel considers theoretical models of the magnetic properties of fine particle systems, with emphasis on dipolar and exchange interactions.

J. Fidler in his paper “Review of bulk permanent magnets” present a lucid and useful overview of properties of permanent magnet materials, with special emphasis on rare earth permanent magnets. In another review paper, H. Warlimont discusses the physics and materials science of soft magnetic materials.

H.A. Leupold contributed three extremely useful papers. In the first paper, methods of magnetic circuit design are outlined. It is shown that with the advent of cobalt–rare earth magnets, it is possible to design magnetic circuits in a way similar to the design of electrical circuits. Leupold shows that all one needs is a knowledge of the standard permeance formulae and the value of B_r for the rare earth magnet.

In his second papers, Leupold discusses the role of magnetic cladding in permanent magnet design. It is shown that magnetic cladding based on rare earth permanent magnet material can significantly increase the magnetic field, or reduce the mass of the magnet.

In his last paper, Leupold describes design of yokeless hollow cylindrical and spherical structures. In such structures, the magnetic poles are placed judiciously in such a way that they produce the desired field where needed while the opposite poles are more remotely placed or negated.

Although the rest of the publication covers a rather specialised field of research into novel magnetic materials, the review papers on properties of permanent magnetic materials and design of magnetic circuits are of fundamental importance for innovation in industrial applications of magnetic separation.

The quality of production is, as usual with Kluwer, very good: high-grade paper, printing and binding. The publication will be a useful addition to a reading list of every serious student of magnetism.

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