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Nota di contenuto	NMR Imaging in Chemical Engineering; Nuclear Magnetic Resonance Imaging in Chemical Engineering Forward; The Discovery of Spin Echoes; List of Contents; Preface from the Editors; List of Contributors; 1 Introduction; 1.1 A Brief Comment; 1.2 The Very Basics of NMR; 1.3 Fundamentals of NMR Imaging; 1.4 Fundamentals of Detecting Motion; 1.5 Bringing Them Together: Velocity Imaging; 1.6 More Advanced Techniques I: Multiple Encoding and Multiple Dimensions; 1.7 More Advanced Techniques II: Fast Imaging Techniques; 1.8 Introducing Color into the Image: Contrast Parameters; 2 Hardware and Methods 2.1 Hardware, Software and Areas of Application of Non-medical MRI2. 1.1 Introduction; 2.1.2 Hardware; 2.1.2.1 Magnets; 2.1.3 Software; 2.1.4 Areas of Application; 2.1.5 Outlook; 2.2 Compact MRI for Chemical Engineering; 2.2.1 Concept of Compact MRI; 2.2.2 System Overview; 2.2.3 Permanent Magnet; 2.2.4 Gradient Coil; 2.2.5 Rf coil; 2.2.6 MRI Console; 2.2.7 Typical Examples of Compact MRI Systems; 2.3 Drying of Coatings and Other Applications with GARField; 2.3.1

Introduction; 2.3.2 GARField Magnets; 2.3.3 Applications; 2.3.4 Human Skin Hydration; 2.3.5 Further Developments; 2.3.6 Conclusion
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 2.5 Microcoil NMR for Reaction Monitoring; 2.5.1 Introduction; 2.5.2 NMR Acquisition in Reaction Monitoring: Stopped- and Continuous-flow; 2.5.3 Reaction Studies Using NMR; 2.5.4 Small-scale NMR Reaction Monitoring; 2.5.5 Multiple Microcoil NMR. Sensitivity and Throughput Issues; 2.5.6 Conclusions; 2.6 Broadening the Application Range of NMR and MRI by Remote Detection; 2.6.1 Introduction; 2.6.2 Motivation; 2.6.3 Principle of NMR Remote Detection
 2.6.4 Sensitivity Enhancement by Remote Detection 2.6.5 Application of NMR Remote Detection; 2.6.6 Concluding Remark; 2.7 Novel Two Dimensional NMR of Diffusion and Relaxation for Material Characterization; 2.7.1 Introduction; 2.7.2 Pulse Sequences and Experiments; 2.7.3 Laplace Inversion; 2.7.4 Applications; 2.7.5 Instrumentation; 2.7.6 Summary; 2.8 Hardware and Method Development for NMR Rheology; 2.8.1 Introduction; 2.8.2 Rheo-NMR Fundamentals; 2.8.3 Apparatus Implementation; 2.8.4 Applications of Rheo-NMR; 2.8.5 Conclusions
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 3.2 Application of Magnetic Resonance Imaging to the Study of the Filtration Process

Sommario/riassunto

How to use nuclear magnetic resonance imaging in chemical engineering. Written by the internationally recognized top experts from academia and industry, this first book dedicated to the topic provides an overview of existing methods and strategies to solve individual problems in chemical engineering. Written in a simple and lively manner and backed by various industrial examples, the book begins with a look at hardware and methods, continuing on to cover porous materials, fluids and flow of increasing complexity from different fields of Chemical Engineering, before finishing off with a review
