1. Record Nr. UNINA9911006835303321

Autore	El-Eskandarany M. Sherif
Titolo	Mechanical alloying for fabrication of advanced engineering materials / / by M. Sherif El-Eskandarany
Pubbl/distr/stampa	Norwich, N.Y., : Noyes Publications/W. Anderew Pub., c2001
ISBN	1-282-71174-1 1-282-01119-7 0-08-094688-7 0-8155-1824-2
Descrizione fisica	1 online resource (259 p.)
Disciplina	669.9 669/.95 21 669.95
Soggetti	Mechanical alloying Physical metallurgy
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Front Cover; Mechanical Alloying for Fabrication of Advanced Engineering Materials; Copyright Page; Preface; Dedication; Acknowledgment; Table of Contents; Chapter 1.Introduction; 1.1 BACKGROUND; 1.2 HISTORY OF STORY OF MECHANICAL ALLOYING; 1.3 MILLING; 1.4 MECHANISM OF MECHANICAL ALLOYING; 1.5 NECESSITY OF MECHANICAL ALLOYING; REFERENCES; Chapter 2.Fabrication of ODS Alloys; 2.1 INTRODUCTION AND BACKGROUND; 2.2 APPLICATIONS AND EXAMPLES; REFERENCES; Chapter 3.Fabrication of Nanophase Materials; 3.1 INTRODUCTION 3.2 INFLUENCE OF NANOCRYSTALLINITY ON MECHANICAL PROPERTIES: STRENGTHENING BY GRAIN SIZE REDUCTION3.3 FORMATION OF NANOCRYSTALLINE MATERIALS BY BALL MILLING TECHNIQUE; 3.4 CONSOLIDATION OF THE NANOCRYSTALLINE MILLED POWDERS; REFERENCES; Chapter 4.Fabrication of Nanocomposite Materials; 4.1 INTRODUCTION AND BACKGROUND; 4.2 FABRICATION OF SiCp/A1 COMPOSITES BY MECHANICAL SOLID STATE MIXING; 4.3 PROPERTIES OF MECHANICALLY SOLID-STATE FABRICATED SiCp/A1 COMPOSITES; 4.4

MECHANISM OF FABRICATION; REFERENCES; Chapter 5.Mechanically Induced Solid State Carbonization; 5.1 INTRODUCTION
5.2 DIFFICULTIES OF PREPARATIONS5.3 FABRICATION OF NANOCRYSTALLINE TiC BY MECHANICAL ALLOYING METHOD; 5.4 PROPERTIES OF MECHANICALLY SOLID-STATE REACTED TiC POWDERS; 5.5 OTHER CARBIDES PRODUCED BY MECHANICAL ALLOYING; REFERENCES; Chapter 6. Mechanically Induced Gas-Solid Reaction; 6.1 INTRODUCTION; 6.2 FABRICATION OF NANOCRYSTALLINE TiN BY REACTIVE BALL MILLING; 6.3 PROPERTIES OF REACTED BALL MILLED TiN POWDERS; 6.4 MECHANISM OF FABRICATION; 6.5 OTHER NITRIDES PRODUCED BY RBM; 6.6 FABRICATION OF NANOCRYSTALLINE SOLID SOLUTION NiTiH BY REACTIVE BALL MILLING; REFERENCES
Chapter 7. Mechanically Induced Solid-State Reduction7.1 INTRODUCTION; 7.2 REDUCTION OF Cu2O WITH Ti BY ROOM TEMPERATURE ROD MILLING; 7.3 PROPERTIES OF ROD MILLED POWDERS; 7.4 MECHANISM OF MSSR; 7.5 FABRICATION OF NANOCRYSTALLINE WC AND NANOCOMPOSITE WC-MgO REFRACTORY MATERIALS BY MSSR METHOD; REFERENCES; Chapter 8. Mechanically Induced Solid-State Amorphization; 8.1 INTRODUCTION; 8.2 FABRICATION OF AMORPHOUS ALLOYS BY MECHANICAL ALLOYING PROCESS; 8.3 CRYSTAL-TO-GLASS TRANSITION; 8.4 MECHANISM OF AMORPHIZATION BY MECHANICAL ALLOYING PROCESS; 8.5 THE GLASS-FORMING RANGE
8.6 AMORPHIZATION VIA MECHANICAL ALLOYING WHEN Hfor = ZERO MECHANICAL SOLID-STATE AMORPHIZATION OF Fe50W50 BINARY SYSTEM; 8.7 SPECIAL SYSTEMS AND APPLICATIONS; 8.8 DIFFERENCE BETWEEN MECHANICAL ALLOYING AND MECHANICAL DISORDERING IN THE AMORPHIZATION REACTION OF A150Ta50 IN A ROD MILL; 8.9 MECHANICALLY-INDUCED CYCLIC CRYSTALLINE-AMORPHOUS TRANSFORMATIONS DURING MECHANICAL ALLOYING; REFERENCES; Index

Sommario/riassunto

Unique in bringing about a solid-state reaction at room temperature, mechanical alloying produces powders and compounds difficult or impossible to obtain by conventional techniques. Immediate and cost-effective industry applications of the resultant advanced materials are in cutting tools and high performance aerospace products such as metal matrix armor and turbine blades. The book is a guided introduction to mechanical alloying, covering material requirements equipment, processing, and engineering properties and characteristics of the milled powders. Chapters 3 and 4 treat the fabrication of