

1. Record Nr.	UNICAMPANIASUN0126617
Autore	Kim, Se-Kwon
Titolo	Essentials of Marine Biotechnology / Se-Kwon Kim
Pubbl/distr/stampa	XXII, 477 p., : ill. ; 24 cm
Edizione	[Cham : Springer, 2019]
Descrizione fisica	Pubblicazione in formato elettronico
Disciplina	576.5 660.6 540 543 577.14 577.7 610.28
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia

2. Record Nr.	UNISA996499861603316
Autore	Biswas Krishanu
Titolo	High entropy materials : processing, properties, and applications / / Krishanu Biswa [and three others]
Pubbl/distr/stampa	Singapore : , : Springer, , [2022] ©2022
ISBN	981-19-3919-5
Descrizione fisica	1 online resource (476 pages)
Collana	Materials Horizons: from Nature to Nanomaterials Series
Disciplina	669.94
Soggetti	Alloys Alloys - Thermal properties
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Intro -- Foreword -- Preface -- Acknowledgments -- Contents -- About the Authors -- 1 High Entropy Materials (HEMs): An Overview -- 1.1 Alloys Why So Important for Civilization -- 1.2 Advent of HEMs: Why Multicomponent Equiatomic Alloys Were Not Extensively Investigated Earlier? -- 1.3 Research on HEMs-How It Started? -- 1.3.1 Research Done by Pioneers -- 1.3.2 J.-W. Yeh -- 1.3.3 S. Ranganathan -- 1.3.4 Jon-Paul Maria and Jian Luo -- 1.4 High Entropy Materials-Basic Concepts -- 1.5 Entropy versus Enthalpy -- 1.6 HEM Family -- 1.7 HEMs and Beyond -- 1.8 Properties -- 1.9 The Scope of the Book -- References -- 2 High Entropy Materials: Basic Concepts -- 2.1 Introduction -- 2.2 Emergence of Four Core Effects-Framing the Basic Concepts -- 2.2.1 The High Entropy Effect -- 2.2.2 The Lattice Distortion Effect -- 2.2.3 The Sluggish Diffusion Effect -- 2.2.4 The "Cocktail" Effect -- 2.3 High Entropy Alloys and Ceramics: Definition and Classification -- 2.3.1 Constituent Element-Based Classification -- 2.3.2 Traditional Crystal Structure-Based Classification -- 2.3.3 Microstructure-Based Classification -- 2.3.4 Density-Based Classification -- 2.3.5 Deformation Mechanism-Based Classification -- 2.4 Composition Notation -- References -- 3 Phase and Microstructural Selection in High Entropy Materials -- 3.1 Introduction -- 3.2 Alloy Design Strategies -- 3.2.1 Predicting Solid Solubility from Hume-Rothery Rules -- 3.2.2 Parametric Approach -- 3.2.3 CALPHAD

Approach -- 3.2.4 Ab Initio Approach -- 3.2.5 Pettifor Map Approach
to Predict the Formation of HEMs -- 3.3 Phase Selection Approach
to Find Single Phase Versus Multiphase HEMs -- 3.4 Design Strategies
for High Entropy Ceramics (HECs) -- 3.5 Microstructure of HEMs -- 3.6
Design Strategies for High Entropy Metallic Glasses -- 3.6.1 Trial
and Error Method -- 3.6.2 Nearly-Free-Electron Method.
3.6.3 Valence Electron Concentration Method -- 3.6.4 Discrete
Variational Method -- 3.6.5 Machine Learning Methods -- References
-- 4 Diffusion in High Entropy Materials -- 4.1 Introduction -- 4.2
Diffusion in Alloys -- 4.3 Diffusion in Multicomponent Systems -- 4.4
Measured Diffusivities in High Entropy Alloys-Validity of the Core
Concept of Sluggish Diffusion -- 4.5 Implications for Diffusion-
Controlled Processes -- 4.5.1 Creep and Superplasticity -- 4.5.2
Diffusional Solid State Phase Transformation in HEAs-Phase Separation
and Precipitation -- 4.5.3 Grain Growth in HEAs -- References -- 5
Application of Artificial Intelligence in the Design of HEMs -- 5.1
Introduction -- 5.2 ICME -- 5.2.1 CALPHAD -- 5.2.2 Ab Initio -- 5.2.3
DFT/MD Simulation -- 5.2.4 MC Simulation -- 5.2.5 Phase-Field
Simulations -- 5.2.6 Machine Learning Approaches -- 5.3 Future
Outlook and Summary -- References -- 6 Synthesis and Processing
of Bulk High Entropy Materials -- 6.1 Introduction -- 6.2 Processing
of HEAs -- 6.2.1 Melting and Casting Route -- 6.2.2 Powder
Metallurgical Processing Route -- 6.3 HEA-Based Composites -- 6.4
High Entropy Ceramics: Oxides, Carbides, and Borides -- 6.5
Combinatorial Materials Synthesis -- 6.6 Additive Manufacturing -- 6.7
Summary -- References -- 7 Synthesis and Processing of HEA Coating
and Thin Films -- 7.1 Introduction -- 7.2 HEA Coatings: Challenges --
7.2.1 Mechanical Alloying -- 7.2.2 Spray Technique -- 7.2.3 Laser
Cladding -- 7.3 HEA Thin Films: Preparation and Challenges -- 7.3.1
Sputtering Technique -- 7.3.2 Ion Beam Sputter Deposition (IBSD) --
References -- 8 Structural Properties -- 8.1 Introduction -- 8.2 Hot
and Cold Working of HEAs -- 8.2.1 Hot Working of HEAs -- 8.2.2 Cold
Working of HEAs -- 8.2.3 Severe Plastic Deformation -- 8.3 Mechanical
Properties of HEAs -- 8.3.1 Elastic Properties -- 8.3.2 Quasistatic
Tensile Behavior.
8.3.3 Transient Plastic Deformation -- 8.3.4 Dynamic Tensile Behavior
-- 8.3.5 Fracture Toughness -- 8.3.6 Strength Ductility Paradox --
8.3.7 Hardness and Wear Resistance -- 8.3.8 Fatigue -- 8.3.9 Creep
and Superplasticity -- 8.4 Corrosion and Oxidation -- 8.5 Summary --
References -- 9 Functional Applications of High Entropy Alloys -- 9.1
Introduction -- 9.2 Magnetism -- 9.3 Electronics -- 9.4
Thermoelectrics -- 9.5 Hydrogen Storage -- 9.6 Catalytic Application
-- 9.7 Sensor Application -- References -- 10 Summary and Future
Direction -- 10.1 Introduction -- 10.2 Goals of Property Improvement
-- 10.3 Advanced Applications Requiring HEMs -- 10.4 Technology
Development -- 10.5 Patents on HEMs -- 10.6 Future Direction --
References -- Appendix A -- Appendix B -- List of Patents --
Appendix C -- References.
