



Biodegradable Metals: From Concept to Applications (SpringerBriefs in Materials)

By Hendra Hermawan

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This book in the emerging research field of biomaterials covers biodegradable metals for biomedical applications. The book contains two main parts where each of them consists of three chapters. The first part introduces the readers to the field of metallic biomaterials, exposes the state of the art of biodegradable metals, and reveals its application for cardiovascular implants.

Some fundamental aspects to give basic understanding on metals for further review on the degradable ones is covered in chapter one. The second chapter introduces the concept of biodegradable metals, its state of the art and discusses a shifted paradigm from inert to bioactive, from corrosion resistant to corrodible metals. The third chapter focuses on the challenges and opportunities of using biodegradable metals for cardiovascular applications. The second part exposes an example of biodegradable metals from its concept to applications where a complete study on metallic biodegradable stent is detailed from materials design, development, testing till the implant fabrication. The fourth chapter reveals new alloys development devoted for metallic biodegradable stent based on required criteria derived from clinical needs and current nondegradable stents properties. Degradation of the alloys in simulated arterial conditions and its effect to cells are exposed in chapter five. The both chapters are concluded with a benchmarking of some more recent researches on materials development and testing for biodegradable stents. Chapter six reveals the transformation process of the materials into stent prototypes where a standard process for making 316L stainless steel stents was followed. The book is completed by a perspective on the use of biodegradable metals for biomedical applications in the era of tissue engineering.

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Editorial Review

From the Back Cover

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