

Diamondoid Molecules: With Applications in Biomedicine, Materials Science, Nanotechnology and Petroleum Science, by G. A. Mansoori, P. Lopes Barraos de Araujo, and E. Silvano de Araujo, 1st ed., Word Scientific Pub. Co., Hackensack, NJ, 2012, (Hardcover: 400+pages, Language: English), ISBN=10: 9814291609; ISBN=13: 978-9814291606.

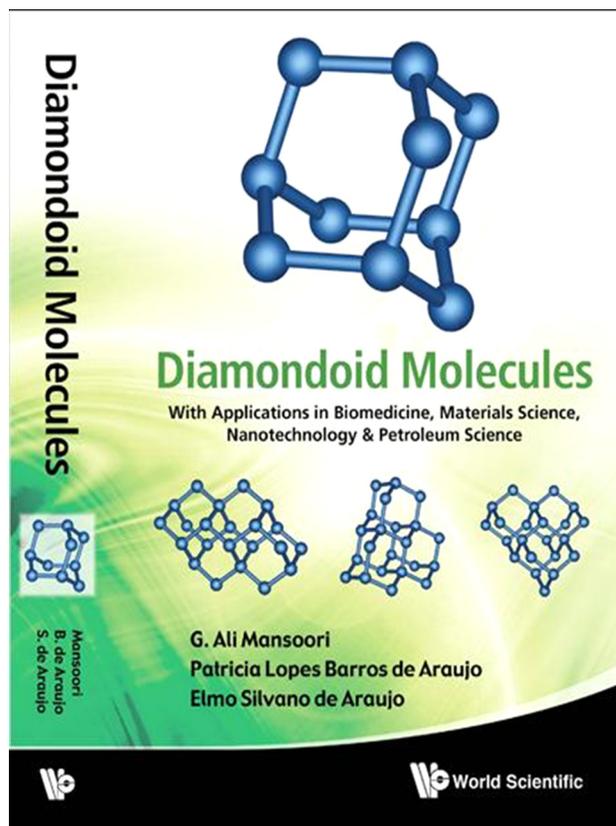
REVIEWED BY BRUCE CHEHROUDI¹

This is a fascinating book dealing with diamondoid molecules which are important molecular building blocks in bottom-up nanotechnology. Diamondoids have lattice structures similar to diamond. They have found many applications in nanotechnology, biomedicine, materials science, and petroleum science which are presented in this comprehensive book. This book also tells us the great potential that diamondoids have for derivatization with interesting properties. To demonstrate the vast number of applications that diamondoids are having I share Figure 1.20 of the book (below) which shows the U.S. issued patents related to diamondoids (black columns, left Y-axis) and percentage of patents on pharmaceutical/medical application of diamondoids (empty circles/black line, right Y-axis), from January 1950 to December 2009.

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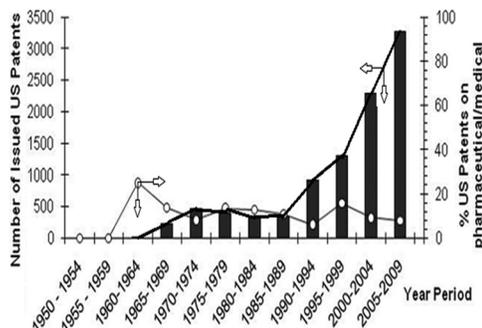
This book, in addition to giving the readership the role of diamondoids as molecular building blocks in nanotechnology, it gives the readership an excellent background science and technology about molecular structure, physics and chemistry of diamondoids, the role and nature of diamondoids in fossil fuels, physical properties of diamondoids, properties of diamondoids, and biomedical and materials science applications of diamondoids. Interestingly, it is shown in this book that ab initio calculations are quite useful for molecular property prediction of diamondoids and their derivatives, especially for the fact that there exist a huge number of such molecules. The book also gives an excellent description of quantum confinement effects and negative electron affinities of diamondoids which are their unique characteristics. The first-principles simulations of interaction of diamondoids with other systems such as carbon nanotubes, metallic surfaces, and metallic AFM cantilever tips, which are the promising ways to design new nanomaterials are well presented in this book. Additionally, functionalized diamondoids which have led to the creation of nanosystems with new chemical and physical properties and with suitable applications in pharmacology and electronic devices are also presented very well in this book.

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According to this book, diamondoids are generally optically transparent in visible light and have high electrical insulating properties as diamond does. It is also interesting to learn from this book that, the many derivatives of diamondoids are expected to have many interesting opto-electronic properties. This book reports results of numerous investigations into properties of diamondoids and derivatives' opto-electronic properties.

The book is made of seven chapters and a comprehensive glossary. Every chapter is well illustrated with many well organized



tables and appropriately designed figures and graphs. I congratulate Professor Mansoori and his colleagues to write this book and I recommend it highly to senior-undergraduate or graduate students of nanoscience, nanomedicine, and nanotechnology.

Dr. Chehroudi, Chief Scientist at Advanced Technology Consultants, has accumulated years of technical and leadership experiences in different capacities and organizations. He has won many technical merit and leadership awards for his contributions. Dr. Chehroudi has a Ph.D. in Mechanical & Aerospace Engineering (Princeton University), Post-Doctoral Fellow (Princeton

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