Abstract

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Evolution of High Performance Sustainable Magnesium Based Materials for Sustainable Planet Earth

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Abstract

Irresponsible use of natural resources such as fossil fuels and environmentally toxic technologies developed over last century has been instrumental for us to enter mass extinction even that is only sixth in last half billion years. The root cause of widespread weather disturbances particularly recorded over last 25 years are primarily attributed to the greenhouse gas emissions with transportation sector, a key player. Attempts have been initiated to reduce the greenhouse gas emissions and one relatively simpler way is through the use of lightweight materials. Magnesium being 35% lighter than currently used aluminum provides a perfect option. Widely available in planet earth coupled with its nutritional characteristics, magnesium is a perfect material that is sustainable and suitable for both engineering and biomedical sectors. In view of the tremendous potential of magnesium based materials, the present talk will focus on the recent developments in the evolution of magnesium based materials including nanocomposites, metastable composites, syntactic composites and magnesium containing high entropy alloys. Insight will be provided on their synthesis and key characteristics primarily focusing on mechanical properties.

Biography

M. Gupta Born in New Delhi in 1961, Manoj Gupta had his schooling in the same town and graduated in Metallurgical Engineering in 1984 from Visvesveraya Regional College of Engineering, Nagpur, securing a first class with distinction. Following that Manoj completed his M. Eng. degree (Metallurgy) in 1987 from Indian Institute of Science, Bangalore and was awarded the GOLD MEDAL. He pursued his doctoral programme in University of California, Irvine and obtained his Ph.D. in 1992. After that he spent 4 months as Post-Doctoral Fellow in University of Alberta, Canada. He took up the job in NUS, Singapore in 1993 and is continuing there till now. Currently, Dr. Manoj Gupta is an Associate Professor. He was formerly, Head of Materials Division of the Mechanical Engineering Department and Director designate of Materials Science and Engineering Initiative of National University of Singapore. His current research interests include processing, microstructure and properties evaluation of advanced structural materials for multiple engineering and biomedical applications. To his credit are: (i) 'Disintegrated Melt Deposition' technique, a unique liquid-state processing method, and (ii) 'Hybrid Microwave Sintering' technique, an energy efficient solid-state processing method, to synthesize Al and Mg light-metal alloys/micro/nano-composites.