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Manoj Gupta, J Material Sci Eng 2018, Volume 7
DOI: 10.4172/2169-0022-C4-100

5th World Congress on

SMART AND EMERGING MATERIALS

April 19-20, 2018 Dubai, UAE

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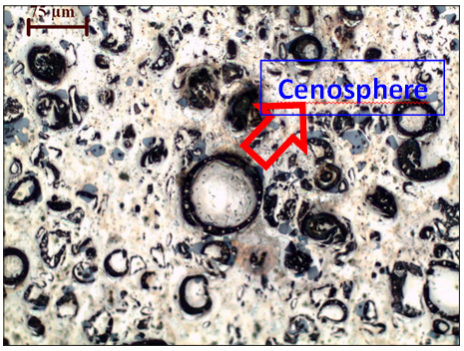
Light weight magnesium based materials for CO_2 mitigation and biomedical applications



The significant rise in land, water and air pollution has led the researchers worldwide to look into materials and technologies that can sustain and utilize materials that are not toxic even under the conditions of indiscriminate disposal by rogue industries. Magnesium is a perfect solution for material researchers to address above issues. It is one of the most abundant elements in planet earth (both land and water bodies) that possess nutritional characteristics for wellbeing of both plants and animals. Being the lightest metallic element (1.74 g/cc) that can be used as structural material in both engineering and biomedical applications, it guarantees the reduction in CO_2 emission in weight critical applications such as transportation sector (including automobile, aerospace, space and sports sectors). The aluminum based materials (density ~2.7 g/cc) are currently used extensively in transportation sector as lightweight materials and Magnesium based materials can offer ~33% saving at component level. For biomedical sector, Magnesium based materials offers a unique advantage of degrading within body thus assisting in avoiding revision surgery and minimizing patient trauma, doctor's time and medical treatment cost. Accordingly, the aim of this presentation will be to provide a snapshot to the audience with a diverse background about the dynamic and multifunctional capabilities of Magnesium based materials that are likely to make it a dominant metallic material in very near future.

References

1. M Gupta and Sharon Nai (2011) Magnesium, Magnesium Alloys and Magnesium Composites. John Wiley.
2. M Gupta and N Gupta (2017) Utilizing Magnesium based Materials to Reduce Green House Gas Emissions in Aerospace Sector. Aeronautics and Aerospace Open Access Journal; 1(1): 00005.
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Recent Publications

1. M Gupta and N Gupta (2017) Utilizing Magnesium based Materials to Reduce Green House Gas Emissions in Aerospace Sector. Aeronautics and Aerospace Open Access Journal; 1(1): 00005.
2. Vyasaraj Manakari, Gururaj Parande, Mrityunjay Doddamani, Manoj Gupta (2017) Enhancing the ignition, hardness and compressive response of Magnesium by reinforcing it with hollow glass microballoons. Materials; 10: 997.

Biography

Manoj Gupta was the Former Head of Materials Division of the Mechanical Engineering Department and Director designate of Materials Science and Engineering Initiative at NUS, Singapore. He did his PhD from University of California, Irvine, USA (1992) and Postdoctoral Research at University of Alberta, Canada (1992). In August 2017 he was highlighted among Top 1% Scientist of the World Position by The Universal Scientific Education and Research Network. He has published over 455 peer reviewed journal papers and owns two US patents. He has also co-authored six books, published by John Wiley, Springer and MRF, USA.

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