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Authors: Satpal Sharma, Shashi Prakash Dwivedi



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Effects of Waste Eggshells and SiC Addition on Specific Strength and Thermal Expansion of Hybrid Green Metal Matrix Composite

¹Satpal Sharma, ^{1,2}Shashi Prakash Dwivedi*

¹School of Engineering, Gautam Buddha University, Greater Noida, Gautam Buddha Nagar,
U.P. 201310, India

²Noida Institute of Engineering and Technology, Greater Noida, Gautam buddha Nagar, U.P.
201310, India

*Corresponding Author: E-mail- shashi_gla47@rediffmail.com

Highlights

- Fabrication of hybrid green metal matrix composite using waste eggshell and SiC particles
- Specific strength and thermal expansion analysis
- Overall density and cost
- Comparative study of hybrid MMCs properties before and after heat treatment

Abstract

Chicken eggshell waste is an industrial byproduct, and its disposal constitutes a serious environmental hazard. Chicken eggshell can be used in commercial products to produce new materials with low cost and density. Low density material which can sustain at higher temperature is a remarkable area of research. Keeping these facts in the mind, the present investigation aims to study the physical behaviour, specific strength and thermal expansion of AA2014/SiC/carbonized eggshell hybrid green metal matrix composites. Microstructure of hybrid green metal matrix shows that the reinforcement particles (SiC particulates and carbonized eggshells particles) are uniformly distributed in the matrix AA2014 alloy. Specific strength for the composites containing 2.5 wt. % SiC and up to 7.5 wt. % carbonized eggshell was observed to be higher than that of the other selected composites. While for the same composition (AA2014/2.5 % SiC/7.5 % carbonized eggshell composites), porosity was observed lower than other selected composites. The results revealed that sample of AA2014/2.5 % SiC/7.5

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