A NOVEL HONEYCOMB STRUCTURE COMBINED WITH GRAPHENE AEROGEL AND COATING FOR HIGH-PERFORMANCE ELECTROMAGNETIC WAVE ABSORPTION

Shuangqiang Shi, Cheng Yang, Yubin Chen, Hairong Chu

[1] Research Center of Graphene Applications, Beijing Institute of Aeronautical Materials, Beijing, China
[2] Beijing Institute of Graphene Technology, Beijing, China

The development and application of electromagnetic (EM) wave absorbing materials are of great importance to EM radiation protection and radar stealth technology [1]. On the way toward high-performance EM wave absorbers, graphene materials with light weight and broad absorption bandwidth appear as promising candidates [2, 3]. Herein, a wave-absorbing honeycomb simulation calculation model combined with three-dimensional graphene aerogel and conductive graphene coating was creatively developed to investigate structural absorbing materials. The permittivity values of graphene aerogel and coating, as well as the coating thickness and height, have profound effects on the EM wave absorption properties of the structure and were firstly optimized by EM simulation software. Subsequently, the wave-absorbing honeycomb sample based on the simulated parameters was fabricated and tested. A parallel study between simulation and experiment showed that the reflection loss values of the optimized honeycomb sample can reach −10 dB in the frequency range from 2.5 GHz to 18 GHz. In conclusion, this work demonstrates that the overall tendency of the measured results was in good agreement with the simulated results, and gives original and new perspectives on the design of graphene materials for EM wave absorption.

References

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