

Accepted Manuscript

Hexagonal boron nitride/polymethyl-vinyl siloxane rubber dielectric thermally conductive composites with ideal thermal stabilities

Junwei Gu, Xudong Meng, Yusheng Tang, Yang Li, Qiang Zhuang, Jie Kong

PII: S1359-835X(16)30373-6
DOI: <http://dx.doi.org/10.1016/j.compositesa.2016.11.002>
Reference: JCOMA 4474

To appear in: *Composites: Part A*

Received Date: 28 September 2016
Revised Date: 21 October 2016
Accepted Date: 1 November 2016

Please cite this article as: Gu, J., Meng, X., Tang, Y., Li, Y., Zhuang, Q., Kong, J., Hexagonal boron nitride/polymethyl-vinyl siloxane rubber dielectric thermally conductive composites with ideal thermal stabilities, *Composites: Part A* (2016), doi: <http://dx.doi.org/10.1016/j.compositesa.2016.11.002>



This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Hexagonal boron nitride/polymethyl-vinyl siloxane rubber dielectric thermally conductive composites with ideal thermal stabilities

Junwei Gu*, Xudong Meng⁺, Yusheng Tang, Yang Li, Qiang Zhuang, Jie Kong*

Key Laboratory of Space Applied Physics and Chemistry, Ministry of Education,
Department of Applied Chemistry, School of Science, Northwestern Polytechnical
University, Xi'an, Shaanxi, 710072, P. R. China

Abstract: Hexagonal boron nitride/polymethyl-vinyl siloxane rubber (*hBN*/VMQ) dielectric thermally conductive composites were fabricated *via* kneading followed by hot compression method. The thermally conductive coefficient (λ), thermal diffusion coefficient (α), dielectric constant (ϵ) and dielectric loss tangent ($\tan\delta$) values were all increased with the increasing addition of *hBN* fillers. When the volume fraction of *hBN* fillers was 40 vol%, the corresponding λ and α was 1.110 W/mK and 1.174 mm²/s, 6 and 9 times than that of pure VMQ matrix, respectively. The corresponding ϵ and $\tan\delta$ was 3.51 and 0.0054, respectively. Furthermore, the tensile strength and $T_{\text{Heat-resistance index}} (T_{\text{HRI}})$ values were both maximum with 20 vol% *hBN* fillers, tensile strength of 3.31 MPa, 12 times than that of pure VMQ matrix (0.28 MPa), and T_{HRI} of 253.8°C. The obtained *hBN*/VMQ composites present great potential for packaging in continuous integration and miniaturization of microelectronic devices.

Keywords: A. Polymer-matrix composites (PMCs); B. Thermal properties; D. Compression moulding.

*Corresponding author to J.W. Gu and J. Kong, E-mail address: nwpugjw@163.com & kongjie@nwpu.edu.cn, Tel: +86-29-88431621. The author Xudong Meng⁺ contributed equally to this work and should be considered co-first author.

Download English Version:

<https://daneshyari.com/en/article/5439685>

Download Persian Version:

<https://daneshyari.com/article/5439685>

[Daneshyari.com](https://daneshyari.com)