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Key summary data

Patent	 Indeterminate	Publication date	2021-07-02
DWPI family		Expiration date	-
INPADOC family	No associated INPADOC family	Remaining life	-
Original assignee	DRDO, IN	Domain Influence	1.00
Optimized assignee	INDIA DEFENCE RES & DEV ORG	Strategic Importance	1.00
Ultimate parent	INDIA DEFENCE RES & DEV ORG	Combined Patent Impact	1.00

Bibliography

DWPI title

Multifunctional polymer nanocomposite composition used for e.g., article comprises polymer base, functionalized nanofiller and micro filler in which one of functionalized nanofiller and micro filler is dispersed in polymer base

Original Title

POLYMER NANOCOMPOSITE AND IMPLEMENTATIONS THEREOF

English Title

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Assignee/Applicant

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IN201911054049A / 2019-12-26 / IN

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Abstract**DWPI abstract**

(IN201911054049A_)

Novelty

A multifunctional polymer nanocomposite composition comprises (a) ≥ 1 polymer base; (b) 1-5 php ≥ 1 functionalized nanofiller; and (c) 30-70 php ≥ 1 micro filler, where the ≥ 1 functionalized nanofiller and ≥ 1 micro filler is dispersed in ≥ 1 polymer base.

Detailed description

An INDEPENDENT CLAIM is included for preparing the multifunctional polymer nanocomposite composition which involves (a) obtaining ≥ 1 polymer base; (b) incorporating ≥ 1 functionalized nanofiller and ≥ 1 micro filler to obtain a first mixture; (c) incorporating the first mixture and ≥ 1 conductive polymer to obtain a second mixture; (d) incorporating the second mixture and ≥ 1 polymer base to obtain a third mixture; and (e) incorporating the third mixture, ≥ 1 processing aid and ≥ 1 curative agent to obtain the multifunctional polymer nanocomposite composition.

Use

A multifunctional polymer nanocomposite composition used for article (claimed). Can be used as EMI shielding gasket, EMI pads and in aerospace and military platforms for protecting mission critical electronic equipments.

Advantage

The nanocomposite composition exhibits enhanced electrical conductivity, mechanical strength, thermal conductivity, and enhanced electromagnetic interference shielding properties. The process is very simple, efficient, and industrially viable process to prepare multifunctional nanocomposite composition.

Technology Focus

ORGANIC CHEMISTRY- Preferred Components: The ≥ 1 nanofiller is functionalized with ≥ 1 dispersing agent, the ≥ 1 dispersing agent is selected from p-sulfonato calixarene, tetra-tert.-butylcalixarene, p-allylcalixarene and/or calixarene hydroxamate, and where ≥ 1 functionalised nanofiller has a degree of functionalization with ≥ 1 dispersing agent of 1-10%. Preferred Parameters: The composition has mechanical strength of 3-5 MPa. The composition has thermal conductivity of 0.3-0.6 W/K/m. The composition has Electromagnetic Interference (EMI) shielding efficiency of 25-54 dB in a frequency range of 500 kHz-18 GHz. The composition has volume resistivity of 5-50 $\Omega \cdot \text{cm}$. The ≥ 1 functionalized nanofiller has an average particle size of 20-60 nm. The ≥ 1 micro filler has an average particle size of 100 nm-1 μm . The ≥ 1 conductive polymer has an average particle size of 50-400 nm.

POLYMERS- Preferred Components: The composition further comprises ≥ 1 conducting polymer in amount of 1-5 php, and ≥ 1 processing aid in amount of 5-15 php, and ≥ 1 curative agent in amount of 3-10 php. The ≥ 1 polymer base comprises a polymer selected from polydimethyl silicone, and/or ethylene propylene diene terpolymer, the ≥ 1 functionalized nanofiller is selected from

single walled carbon nanotubes (CNT), multi-walled CNT (MWCNT), double-walled CNT, graphene, carbon nano-cones, fullerenes, carbon nanohorns, carbon nano-onions, and/or carbon nano-buds, and the ≥ 1 micro filler is selected from carbon black, acetylene black, and/or variants of furnace black. The ≥ 1 conducting polymer is selected from polyaniline, conductive polyaniline doped with dodecyl benzene sulfonic acid, p-toluene sulfonic acid, poly styrene sulfonic acid, and/or camphor sulfonic acid, the ≥ 1 processing aid is selected from dioctyl phthalate, stearic acid, dibutyl phthalate, polypropylene adipate, naphthenic oil, and/or ethylene glycol, and ≥ 1 curative agent is selected from dicumyl peroxide, dibutyl peroxide, tert.-butyl perbenzoate, tert.-butylcumyl peroxide, dibenzoyl peroxide, polymeric peroxides, peroxy esters, and/or ketals.

Abstract

The present disclosure provides a multifunctional polymer nanocomposite composition comprising: a) at least one polymer base; b) 1-5 php of at least one functionalised nanofiller; and c) 30-70 php of at least one micro filler, wherein the at least one functionalised nanofiller and the at least one micro filler dispersed in the at least one polymer base. A convenient process for preparing the composition is also provided. The compositions of the present disclosure exhibits effective ElectroMagnetic Interference(EMI) shielding properties along with good physical, mechanical, thermal and electrical properties. An article comprising the multifunctional polymer nanocomposite composition is also disclosed herein.

Classes/Indexing

DWPI class

A12 A26 A85 A95 L03 S03 V04

DWPI manual codes

 Expand DWPI manual codes

DWPI chemistry resource numbers

 Expand DWPI Chemistry Resource Numbers

DWPI registry numbers

 Expand DWPI Registry Numbers

Plasdoc punch codes

 Expand Plasdoc Punch Codes

Plasdoc key serial codes

 Expand Plasdoc Key Serial Codes

Enhanced polymer indexing

 Expand Enhanced Polymer Indexing

Chemical fragment codes

 Expand Chemical Fragment Codes

Legal status

Predictive Analytics

Predictive Type	Data
Probability of Grant	55.22
Probability of Early Lapse	-

Probability of Restoration Post-Lapse	-
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INPADOC Legal Status

Get Family Legal Status

Family

Family

- INPADOC Family (0)
- Expand DWPI Family (1); Countries/Regions (1) **DWPI family:**

Claims

Claims

1. A multifunctional polymer nanocomposite composition comprising: a. at least one polymer base; b. 1-5 php of at least one functionalised nanofiller; and c. 30-70 php of at least one micro filler, wherein the at least one functionalised nanofiller and the at least one micro filler dispersed in the at least one polymer base.

- Expand All Claims (14)

Description

Background/ Summary

- Expand Background/Summary

Drawing description

- Expand Drawing Description

Description

- Expand Description

Citations

Citation *Record level*

- Citing Patents (0)
- Cited Patents (0)
- Cited Non-patents (0)

DPCI Citation *Patent family level*

- DPCI Citing Patents (0)
- DPCI Cited Patents (0)
- DPCI Cited Non-patents (0)
- DPCI Citation Counts



DPCI Field of search

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DPCI Citing Patents Country/Region

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DPCI Cited Patents Country/Region

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Other

No Other exists for this Record

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