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**Preparation of highly conductive composites with segregated structure based on Polyamide-6
and reduced graphene oxide**

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ABSTRACT: Polyamide-6 microspheres were synthesized via in-situ anionic ring-opening of caprolactam (CL). Subsequently, high-performance conductive composites based on reduced graphene oxide (RGO) and polyamide-6 (PA6) were prepared via solution mixing and hot compression molding. The study was carried out with two different reduction methods of graphene oxide (In-situ thermal reduction and chemical reduction). The materials present outstanding electrical properties own to the successful creation of the segregated structure.

Key words: Microspheres, Reduced graphene oxide, Percolation threshold, Segregated structure, Carbon materials, Polymeric composites

1. Introduction

Conductive polymer composites (CPCs) materials are a hot issue of functional polymer materials these years, and it is widely used as anti-static material, electromagnetic interference (EMI) shielding applications and sensors due to its superiorities of easily processing, light weight, and tunable conductivity [1-2]. Traditional CPCs prepared by melt mixing always requires high percolation concentration to acquire satisfactory electrical properties [3].

Through controlling the distribution of conductive fillers located at the interfaces between the polymeric matrix particles to fabricate a segregated architecture could obviously decrease the percolation

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