heating of the sample, give us information concerning the movement of flow units and to the growth of nanostructures, as superclusters and nanocrystalls. The mechanical agitation added to the cryogenic stresses in the BMG, lead to the growth of microalloy which may give rise to the medium-range order structure as well as increase the small nanocrystalline region scattered into the glassy structure.

Acknowledgments: São Paulo Research Foundation (FAPESP)/BR: grants #2013/13378-1 and #2013/05987-8, Program for the Development of Basic Science (PEDECIBA)/UY.
[1] J. Tan, G. Wang, Z Y Liu, J. Eckert., Sci Rep, 4, 3897 (2014).
[2] A. Hirata, L. J. Kang, T. Fujita, B. Klumov, K. Matsue, M. Kotani, A. R. Yavari, M. W. Chen, Science, 341(6144), 376 (2013).

VIP075

Prof. Rezaie H.R
School of Metallurgy and Material Engineering,
Iran University of Science and Technology, Iran

Preparation and Optimization of Milling Parameters of Magnesium Calcium Phosphate Nanopowders as Abiodegradable Cement

M. Karfarma, H.R. Rezaie*, J. Javadpour, M.H. Esnaashary, M.R. Naeimi-Jamal
School of Metallurgy and Material Engineering, Iran University of Science and Technology
*Corresponding author: hrezaie@iust.ac.ir

Magnesium calcium phosphate cement (MCPc) is a kind of novel biodegradable cement for clinical applications. To improve its bioactivity and reinforcing properties, MCPc nano-powders was produced by high energy ball milling method. First, magnesium calcium phosphate precursor powders were synthesized via an emulsion precipitation method, then the powders were mixed with (NH4)2HPO4 solution to produce MCPc. MCPc was milled and four parameters included milling time, ball to powder weight ratio, ball size and speed of the milling were investigated to understand their effect on the milling process of nano-MCPc particles. The obtained powders were characterized by XRD, FT-IR, SEM and DLS analyses. The study shows that the optimum conditions for the nano-MCPc is achieved when grinding is performed at a speed of 400 rpm using a 10 mm diameter ball at a charge ratio of 30:1 for 15 h.

Keywords: High energy ball mill; Magnesium calcium phosphate; Magnesium phosphate; Nano-powders; Bone cement.

DSL164

Prof. Leonardo G.A. Silva
Instituto de Pesquisas Energéticas e Nucleares (IPEN – CNEN/SP),
São Paulo, Av. Professor Lineu Prestes 2242, 05508-000,
Brazil

Characterization of Nanocomposits Based on Polyethylene Terephthalate (PET) Containing Reduced Graphene Oxide for Application in Antistatic Packaging

L.F. Miranda1, A.H. Munhoz Jr.1, L. Brandão1, M. V. Rossi1, T. J. Masson1, L.G.A. Silva2
1Universidade Presbiteriana Mackenzie, São Paulo - Brazil
2IPEN, São Paulo – Brazil

leila.miranda@mackenzie.br

Package for electronic components is one that protects an electronic or electrical device against electrostatic discharge. Traditionally, antistatic packages are produced with polystyrene (PS) or polypropylene (PP) filled with carbon black. Recently studies have been carried out, with successfully, for the application of polyethylene terephthalate (PET) filled with carbon for this purpose. This work aimed to obtain and characterize nanocomposites based on PET filled with reduced graphene oxide and compare its physicochemical properties with PET filled with carbon black and PP filled with carbon black used in anti-static packaging. PET compounds containing 0.1; 0.3; 0.5 and 0.7wt% reduced graphene oxide, obtained by the modified Hummers process from the graphite and reduced with hydrazine. The thermomechanical, electrical and morphological properties of the obtained compounds were determined. The results showed that the addition of reduced graphene oxide to PET causes an increase in the melt flow index, also increase the tensile strength and electrical conductivity. The addition of reduced graphene oxide promotes the decrease in the hardness and thermal resistance of the obtained nanocomposites. Nanocomposites based on PET containing 0.5wt% and 0.7wt% reduced graphene oxide can be used in the handling, transport and storage of electronic components since their mechanical, thermal and resistivity properties are satisfactory for this purpose.

DSL030

Ms. Carolina Comin Tegon
Materials Engineering Department
Mackenzie Presbyterian University,
Rua da Consolação, 930 – 01302-907
São Paulo/SP, Brazil

Graphene Oxide/ Polymer Nanocomposite Produced from Recycled Packagings

C.C. Tegon, A.A. Oliveira, M.C. Terence, J.A.G. Carrió
Presbyterian University Mackenzie, São Paulo, 01302-907, Brazil

Flexible packaging is widely used in the current market due to its good mechanical, thermal properties and gas permeability. However, according to a Brazilian research [1], the plastic waste management progress in Brazil has occurred slowly. It was published that from 2010 to 2014 the production of waste grew 29% [1]. However, in this content, the production of nanocomposites made from recycled polymers has been increased progressively. The search for polymeric nanocomposites from recycled polymers has lead nanotechnology researchers in the entire world to fabricate new nanostructured materials [2]. The management of solid waste as well as a new range of applications benefit from the improvement in mechanical, thermal and optical properties of those materials.

In this work, a PP/GO nanocomposite was synthesized using 1kg of recycled polypropylene (PP) from waste of food packaging. Graphene oxide (GO) was fabricated using a specific Brazilian graphite precursor of low cost [3]. The physical properties of the obtained material indicate that it can be employed in a new variety of applications like 3D printing. The nanocomposite was characterized by rheological testing (dynamic-mechanical analysis (DMA)), mechanical testing (tensile strength, resistance to bending at three point, impact strength and hardness), thermal testing (under load deflection temperature and Vicat softening temperature), Fourier Transformed Infra-Red Spectroscopy (FTIR), x rays diffraction (XRD), scanning electron microscope (SEM), Raman spectroscopy and thermogravimetric and differential thermal analysis (TG/DTA).

[1] ABRELPE – Association of Public Cleaning Companies and Special Waste