Accepted Manuscript

Flame retarding performance of elastomeric nanocomposites: A review

Prashant S. Khobragade, D.P. Hansora, Jitendra B. Naik, Aniruddha Chatterjee

PII: S0141-3910(16)30170-7

DOI: 10.1016/j.polymdegradstab.2016.06.001

Reference: PDST 7978

To appear in: *Polymer Degradation and Stability*

Received Date: 18 January 2016

Revised Date: 30 May 2016

Accepted Date: 5 June 2016

Please cite this article as: Khobragade PS, Hansora DP, Naik JB, Chatterjee A, Flame retarding performance of elastomeric nanocomposites: A review, *Polymer Degradation and Stability* (2016), doi: 10.1016/j.polymdegradstab.2016.06.001.

Flame Retarding Performance of Elastomeric Nanocomposites: A Review

[$]Prashant S. Khobragade[a], [$]D.P. Hansora[a], Jitendra B. Naik[a], Aniruddha Chatterjee [a,†,*]

[a]*University Institute of Chemical Technology, North Maharashtra University, Jalgaon, Maharashtra, India*
[†]*Present Address: Maharashtra Institute of Technology, Aurangabad, Maharashtra, India*

ABSTRACT

This article presents a comprehensive review about previous research done for the development of elastomeric nanocomposites (NCs) based flame retardant (FR) materials. Conservatively, a single fire retardant element can achieve fire retardancy, but we report about combinations of elastomers and various fire retardant materials at nanoscale, including layered materials and inorganic materials for the development of polymeric and elastomeric NC based FR materials. We have critically reviewed and summarized the surface morphological structure, organic treatment for surface modification, dispersion phenomenon, fire retardant action and the flame-retarding properties of various elastomeric NCs. We also highlight the fundamentals and combustion mechanism of fire retardancy tests, which have been used to describe fire behavior, nature and modes of FR materials and their synergistic effects. We have focused particularly on elastomeric NCs filled with specific, finely dispersed different nanofillers, which will undoubtedly pave the way for development of FR materials showing physico-mechanical and enhanced FR performance. This review article will objectively explore and give new direction for the development of the "FR materials" which would be more accessible to the emerging field of materials science.

KEYWORDS: Fire Retardancy, Flame Retardant, Nanomaterials, Elastomer, Nanocomposites

***CORRESPONDING EMAIL:** aniruddha_chatterjee2006@yahoo.co.in; aniruddha.chatterjee@mit.asia

[$]The authors (D.P. Hansora and P. Khobragade) have contributed equally as first author in this manuscript.