

Accepted Manuscript

Frontal copolymerization in the presence of nano-particles

S.P. Davtyan, A.O. Tonoyan, A.Z. Varderesyan, S.C. Müller

PII: S0014-3057(14)00137-2

DOI: <http://dx.doi.org/10.1016/j.eurpolymj.2014.04.012>

Reference: EPJ 6423

To appear in: *European Polymer Journal*

Received Date: 10 December 2013

Accepted Date: 14 April 2014

Please cite this article as: Davtyan, S.P., Tonoyan, A.O., Varderesyan, A.Z., Müller, S.C., Frontal copolymerization in the presence of nano-particles, *European Polymer Journal* (2014), doi: <http://dx.doi.org/10.1016/j.eurpolymj.2014.04.012>

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.



Frontal copolymerization in the presence of nano-particles

S.P. Davtyan¹, A.O. Tonoyan¹, A.Z.Varderesyan¹, S. C. Müller^{2,*}

¹State Engineering University of Armenia

Teryan Street 105, Yerevan, Armenia, E-mail: atonoyan@mail.ru

^{2,*} University of Magdeburg, Institute of Experimental Physics,

Universitätsplatz 2, D-39106 Magdeburg, Germany

Tel.(+49)391-6718936; E-mail: stefan.mueller@ovgu.de

Abstract

The influence of added nano-particles (SiO_2 , TiO_2) on the process of frontal copolymerization (acrylamide+ methylmetacrylate, acrylamide + styrene) is investigated, and the thermo-physical properties of the obtained nano-composites are studied. Having data of the influence of the amount of nano-particles on the limiting temperature of thermal waves, on the front velocity, and on the law of additive changes concerning the relative thermal capacities of the obtained nano-composites, conclusions can be drawn regarding the positive influence of thermal waves on the process of nano-particle deagglomeration. It is shown, that the dependence of this relative thermal capacity on the amount of nano-particles is non-additive. An analysis of these results shows, that the characteristic sizes of the rigid amorphous fraction formed on the nano-particle surface are characterized not only by the nature and size of the nano-particles, but also by polymeric binding. The thickness of the rigid amorphous fraction is independent of the quantity of nano-additives.

Keywords: nano-composites, thermal waves, thermal capacity, glass transition, rigid amorphous fraction

Download English Version:

<https://daneshyari.com/en/article/7806158>

Download Persian Version:

<https://daneshyari.com/article/7806158>

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