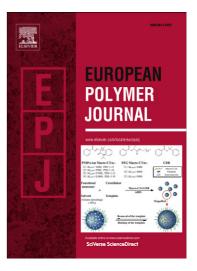
Accepted Manuscript

Acid Catalyzed Polymerization of Macrolactones in Bulk and Aqueous Miniemulsion: Ring Opening vs. Condensation

Ana Pascual, Jose R. Leiza, David Mecerreyes

PII:	S0014-3057(13)00072-4
DOI:	http://dx.doi.org/10.1016/j.eurpolymj.2013.02.009
Reference:	EPJ 5980
To appear in:	European Polymer Journal

Received Date:30 August 2012Revised Date:13 December 2012Accepted Date:14 February 2013



Please cite this article as: Pascual, A., Leiza, J.R., Mecerreyes, D., Acid Catalyzed Polymerization of Macrolactones in Bulk and Aqueous Miniemulsion: Ring Opening vs. Condensation, *European Polymer Journal* (2013), doi: http://dx.doi.org/10.1016/j.eurpolymj.2013.02.009

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.

ACCEPTED MANUSCRIPT

Acid Catalyzed Polymerization of Macrolactones in Bulk and Aqueous Miniemulsion: Ring Opening vs. Condensation

Ana Pascual¹, Jose R. Leiza², David Mecerreyes^{*1,2}

¹ POLYMAT, University of the Basque Country (UPV/EHU), Kimika Aplikatua saila²,

Kimika Zientzien Fakultatea, Joxe Mari Korta Center, Avda. Tolosa 72, 20018

Donostia-San Sebastian, Spain

² Ikerbasque, Basque Foundation for Science, E-48011 Bilbao, Spain

E-mail: david.mecerreyes@ehu.es; Phone: +34 943018018; Fax: +34 943017065

Abstract

Aliphatic polyesters from three macrolactones (pentadecalactone, globalide and ambrettolide) were synthesized by organic acid catalyzed polymerization in bulk and in an aqueous miniemulsion. Two different mechanism of polymerization take place depending on the polymerization media. Relatively high molecular weight polyesters (Mn aprox.10000 gmol⁻¹) were obtained in bulk following a ring opening polymerization mechanism. Interestingly, relatively fast polymerizations were observed which depended in the acid PKa (triflic acid>benzene sulphonic acids>diphenyl phosphate). On the other hand, a condensation mechanism is observed in water miniemulsion leading to oligoesters of aprox. 2000 g/mol. This molecular weight limitation prevented these latexes to be suitable for most applications. Interestingly, it is demonstrated that the introduction of unsaturated macrolactones in these aqueous latexes allows subsequent cross-linking leading to cured polyester films.

Keywords: organic catalysis, ring opening polymerization, macrolactones, miniemulsion.

Download English Version:

https://daneshyari.com/en/article/10609539

Download Persian Version:

https://daneshyari.com/article/10609539

Daneshyari.com