


PREPARATION AND CHARACTERIZATION OF POLY-L-LACTIDE MICROSPHERES

View metadata, citation and similar papers at core.ac.uk

brought to you by  CORE

provided by Digital Repository of the Institute of Technical Sciences of SASA

Ivana Šovanović, Miroslav Mitro, Nenad Ignjatović, Dragan Čukrović

¹Institute of Technical Science of the Serbian Academy of Sciences and Arts,

²The Vinča Institute of Nuclear Sciences, Belgrade, Serbia and Montenegro

INTRODUCTION

Micro- and nanospheres of biodegradable polymers can provide an ideal solution to such an adjuvant problem and realize a controlled and targeted delivery of the drug or antigen with better efficacy and less side effects. Poly-L-lactide (PLLA) is the most widely used and well characterized polymer for biodegradable microspheres. The objective of this study is to design spherical particles made of poly-L-lactide with controlled size. This study investigates the effects of some process variables on the size distribution of particles prepared by precipitation method. The results show that PVA concentration in aqueous solution, polymer molecular weight and type of cosolvent have significant influence on size distribution of the microparticles.

PREPARATION OF MICROSPHERES

Briefly, the method was performed as follows: 50 mg of PLLA was dissolved in chloroform, and this solution was added to methanol or ethanol to form a dispersion. This dispersion was added dropwise to 20 ml PVA solution containing 0.5-1 wt% of PVA while the mixture was stirred at 1200rpm using magneting stirrer. After that solution was centrifugated 2 hours on 4000 rpm, decanted and dried overnight.

RESULTS OF XRD EXAMINATION

Fig. 2 shows the XRD pattern of the products prepared using PVA solution. The pattern exhibits significant peaks at $2\theta=14.9$, 16.8, 19.1 and 22.3° in agreement with the peaks at 15, 16, 18.5 and 22.5 for a PLA homopolymer.

Variables

Polymer MW	50-100 kDA
Surfactant concentration	PVA 0.5-5%
Cosolvents	Methanol, Ethanol

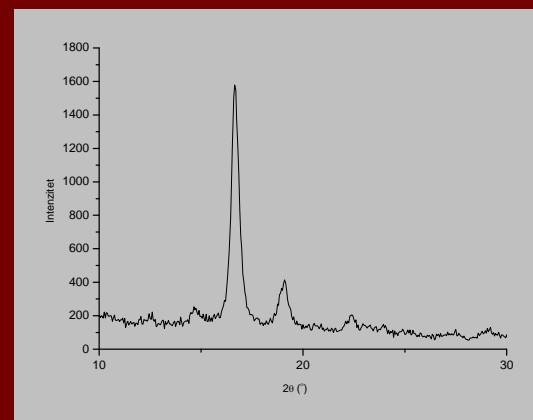


Fig. 1. XRD pattern of products prepared by addition of PLLA into PVA solution

RESULTS OF SEM EXAMINATION

The morphology of microparticles was observed by scanning electron microscopy (SEM). Particles of PLLA powder are spherical and smooth surface, with sizes ranging from less than 1 μ m to several μ m.

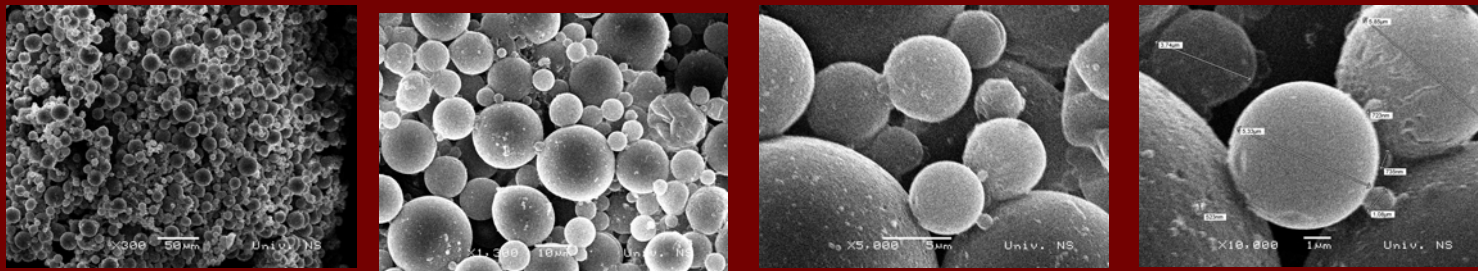


Fig. 1. XRD pattern of products prepared by addition of PLLA into PVA solution