
QUANTITATIVE ANALYSIS OF THE MONOMER PRODUCTS FORMED ON THE HYDROLYSIS OF POLY(STERES) AND POLY(ANHYDRIDES) by R.J. Linhardt, D.R. Planagan, E. Schmitt, H.T. Wang Division of Medicinal and Natural Products Chemistry and Division of Pharmaceutics, College of Pharmacy, University of Iowa, Iowa City, Iowa 52242

BACKGROUND
Biodegradable polymers have a variety of potential biomedical applications in addition to their current use as suture materials [1]. Among the most important of these potential applications is their use in the controlled release of therapeutic agents [2]. These biodegradable polymers used in controlled release applications are primarily insoluble polymers which undergo chemical hydrolysis to soluble monomer or oligomer units [1]. These polymers have both advantages and disadvantages when compared to non-degradable polymers used for controlled delivery. The major advantage is that biodegradable polymers do not require removal after they have delivered their dose. In addition, adverse release reactions from implanted polymer are also avoided since the polymer degrades [3]. However, because these polymers degrade with time, their removal is often difficult, as when a change in therapy is required before an adequate dose is delivered. Also, because of their degradation, toxicity must be performed on both the polymer and all its decomposition products as well as their metabolites. The future utility of biodegradable controlled delivery applications depend on developing accurate methods for the measurement of their degradation products. Ideally, these methods should be useful in measuring concentrations of each soluble monomer and oligomer product and should be sensitive while tolerating interfering substances.

This research focuses on two classes of biodegradable polymers, poly(esters) and poly(anhydrides) as potential carriers of radiosensitive agents for use in cancer treatment and drug delivery. Poly(esters) were used medically as suture material [1] for the first time in 1980, and it was determined that neutral 75% HCl solution at 25°C overnight in methyl ethyl ketone (MEK) at 65°C. Then, the methyl ethyl ketone (MEK) was removed at 65°C. Then, the methyl ethyl ketone (MEK) was removed at 65°C.

MATERIALS AND METHODS
Poly(esters) were used as powders or were spray-dried from a 10% w/v solution in methylene chloride at 25°C using a Yamato Pulvis Mist-Spray CA-32 spray-drier. The particles formed by spray drying were measured by scanning electron microscopy.

464 chlorides, pH 8.6. Periodically aliquots were removed, filtered of particles and the absorbance of the solution was measured at 250 nm. Determination of poly(anhydride) or poly(ester) was suspended with stirring in 50 mL of distilled water and adjusted to pH 7.0 and 60°C. Titrant (0.1 M sodium hydroxide) was added in quantities sufficient to maintain the pH at 7.0 using a 665 Titrator. Both time and volume of titration were recorded.

RESULTS AND DISCUSSION
The hydrolisis of a powdered sample of poly(anhydride) was measured. Even though, titrimetric and ion-chromatography/conductivity methods were used, the hydrolisis rate of PGCP-SA 20:80 has been previously determined by us as 235 mmol/h at 25°C [7]. The hydrolisis rate of PGCP-SA 20:80 was determined by using a pH meter to monitor the pH of the solution. The hydrolisis rate of PGCP-SA 20:80 was determined by using a pH meter to monitor the pH of the solution.

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REFERENCES


