

## **High pressure analysis of melting behavior of biodegradable aliphatic polyesters.**

David R. Rohindra, Keiichi Kuboyama and Toshiaki Ougizawa\*

Department of Organic and Polymeric Materials, Tokyo Institute of Technology, 2-12-1-S8-33, O-okayama, Meguro-ku, Tokyo 152-8552, Japan.

**\*Corresponding author. Tel.: +81-3-5734-2439; fax: +81-3-5734-2439;  
E-mail address: tougizawa@op.titech.ac.jp**

### **Abstract**

Poly(ethylene succinate) (PES) and poly(tetramethylene succinate) (PTMS) are among the most important biodegradable polyesters which show multiple melting peaks in the heating curve of isothermally and non-isothermally crystallized samples. The origin of this complex multiple melting behavior has been proposed to fit the melting, recrystallization and remelting model using Differential Scanning Calorimetry and Temperature Modulated Differential Scanning Calorimetry. However, due to limitations of instrument technique, concrete evidence on the melting mechanism of multiple melting peaks in these polyesters is still a debatable topic. In this study, the double melting behavior of PES and PBS was investigated using high pressure differential thermal analysis (HP-DTA), DSC, Optical microscopy and Transmission Electron Microscopy.

PTMS fits a dual population and melting, recrystallization and remelting model while PES fits the melting, recrystallization and remelting model.