

## **Non-random degradation behavior of poly(3-hydroxybutyrate)in pyrolysis.**

### **ABSTRACT**

Dynamic and isothermal degradation of PHB were conducted in TG, Py-GC/MS, and glass tube oven in order to determine the PHB degradation mechanism. The apparent activation energy of PHB pyrolysis showed a constant value from beginning to the end of the degradation, suggesting that the weight loss occurred during the pyrolysis was resulted from one main reaction. Integration values of total ion count peaks in Py-GC/MS spectra showed that crotonic acid was mainly produced at a temperature range of 270-280°C. From the kinetic analysis of weight loss behavior, it is proposed that there are some kinetically favored scissions occurring at the chain ends, where the degradation proceeded by a 0th-order weight loss process in the middle stage. The observed 0th-order weight loss process was assumed to be an unzipping reaction occurring at ester groups neighboring the crotonate end groups.

**Keyword:** PHB; TG; Pyrolysis.