

**Title: CHARACTERIZATION OF POLY (3-hydroxybutyrate) PRODUCED BY PSEUDOMONAS SPECIE CMM43 IN BIOREACTOR**

**Authors** Crochemore, A. G.<sup>1</sup>, Mattos, M. L. T.<sup>2</sup>, Vendruscolo, C. T.<sup>1</sup>, Suita, L. A.<sup>2</sup>, Moreira, A. S.<sup>1</sup>, Peralba, M. C. R.<sup>3</sup>

**Institution** <sup>1</sup> Federal University of Pelotas, Technology Development Center (Campus Capão do Leão, s/n, CEP 96010-900, Pelotas, RS), <sup>2</sup> Embrapa Temperate Climate (BR 396, Km 78, s/n, CEP 96001-970, Pelotas, RS), <sup>3</sup> Federal University of Rio Grande do Sul (Av. Bento Gonçalves, 9500, CEP 91501-970, Porto Alegre, RS)

**Summary:**

Polyhydroxyalkanoates bioplastics represent a group suitable for various applications, with the advantage of being biodegradable and renewable resource use in production. Their large scale production is still limited due to the cost of the substrate and especially to obtain high cell density cultures. The aim of this study was to evaluate the production of poly (3-hydroxybutyrate) P(3HB) by *Pseudomonas* sp. CMM43 in bioreactor, and properties such as melting temperature and degradation of recovered polymers. Was used the YM medium modified by changing the glucose by sucrose, for inoculum preparation and production of the polymer. The cultivation for the production of P(3HB) was conducted at pH 6.5, 28 °C, 150 rpm and 1 vvm constant at 5 L bioreactor with 3 L working volume were inoculated with 10% (v/v) inoculum in triplicate. The residual sucrose was measured by the dinitrosalicylic acid method, the dry cell mass (MCS) determined gravimetrically, and the quantification of P(3HB) was performed by gas chromatography. The granules of P(3HB) accumulated after 24 h of cultivation were observed in a transmission electron microscope. The P(3HB) was produced technique identified by infrared spectroscopy (FTIR) and thermal properties investigated by differential scanning calorimeter (DSC). The MCS and maximum production of P (3HB) were achieved in 24 h of culture, 3.6 g L<sup>-1</sup> to 1.4 g L<sup>-1</sup>, respectively. The amount of P(3HB) accumulated in relation to the MCS was 37.4%. In 18 h was noticed a consumption of 50% of sucrose available in the medium (10 g L<sup>-1</sup>). The electron micrographs confirmed the presence of granules within the cells. The main absorption bands of FTIR spectra of the extracted polymer characteristics correspond to the homopolymer P (3HB). The values found for melting temperature and crystallinity were lower than those often reported for P(3HB). The thermal stability data showed that the degradation temperature of the P (3HB) was produced to lower the melting. *Pseudomonas* sp. CMM43 got down accumulation of P(3HB) in bioreactor, compared to culture in an orbital shaker. However, the thermal properties were the same, indicating that a characteristic of the specific bacterium and allowing the polymer applications.

**Keywords:** Polyhydroxyalkanoates, thermal properties, *Pseudomonas*

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