

### Production of Polyhydroxyalkanoates by *Ralstonia eutropha* from Volatile Fatty Acids as Carbon Source

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Polyhydroxyalkanoates (PHA) are biodegradable thermoplastics that are accumulated as intracellular granules in various microorganisms. Volatile fatty acids (VFAs) are produced by anaerobic treatment of food wastes and can be utilized as inexpensive substrates for PHA synthesis. In this study, several *Ralstonia eutropha* strains were grown on the mixture of VFAs (acetic, propionic, and butyric acid) as carbon and energy source for growth and PHA synthesis. Among the six strains tested, *R. eutropha* KCTC 2658 accumulated the highest amounts of PHAs up to 50% of dry cell weight from total 5 g/L of VFAs (acetic acid : propionic acid : butyric acid = 1:2:2). Copolymers of 3-hydroxybutyrate (3HB) and 3-hydroxyvalerate (3HV) up to 35 mol% 3HV were produced. Cell growth decreased with increasing the initial concentration of VFAs. Batch culture kinetics showed that butyric acid was consumed first with cell growth and then propionic acid was consumed resulting in an increase in 3HV fraction. With sugar as carbon source, homopolymer of 3HB was produced with PHB contents of 22~29%.