Carbon Dioxide Reduction and High-Value Biomaterials Production Using Waste Medium by *Rhodobacter sphaeroides*

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Rhodobacter sphaeroides are capable of growing under a variety of environmental conditions. *R. sphaeroides* wastewater treatment has received considerable attentions since it can realize wastewater purification and biomass recycling simultaneously. In addition, it has the capability in it, which can produce all kinds of bio-active substances and polyhydroxybutyrate(PHB). Therefore, this study focused on the viability of microbial production of high-value biomaterials and CO_2 reduction are dependent on the development of a wastewater recycling process. We have used in the culture of *Escherichia coli* and *Saccharomyces cerevisiae* medium were used again to produce PHB and bio-active substances. Moreover, we found a possibility that development of CO_2 reduction and PHB production system using industrial waste medium. Therefore, *R. sphaeroides* provides the low cost and eco-friendly process that CO_2 fixation and high-value biomaterials production for using waste medium. This work was carried out with the support of "Cooperative Research Program for Agriculture Science & Technology Development (Project No: PJ01051502)" Rural Development Administration, Republic of Korea.