

**Krzemieniewski, M., Szwarc, D., Zielinski, M., Debowski, M., Kupczyk, K. Possibility of Microalgae Biomass Application for Biogas Enrichment. *Ochrona Srodowiska* 2015, Vol. 37, No. 2, pp. 33–36.**

**Abstract:** Enrichment of biogas, generated in an anaerobic continuously stirred tank reactor (CSTR), achieved by carbon dioxide removal with cultivated microalgae was assessed in terms of the process efficacy. An impact of this technological measure on the efficiency of microalgae biomass proliferation in the closed photobioreactor was also determined. In the experiment, the mixed microalgae culture was used, including *Chlorella* spp. (90%) and *Scenedesmus* spp. (10%), as well as the biogas from dairy wastewater fermentation. Raw biogas was used in variant 1 of the research and the pre-desulfurized biogas was applied in variant 2. The experiments demonstrated higher CO<sub>2</sub> removal efficiency by the microalgae biomass when desulfurized biogas was applied in comparison to the technological system fuelled with the raw biogas. The highest rate of microalgae biomass increase and the highest final biomass content was observed in the system fuelled with the desulfurized biogas. Also, most efficient use of nutrients from the culture medium was found in this technological variant. In addition, it was established that the use of microalgae biomass to CO<sub>2</sub> biosequestration and biogas enrichment led to the increased oxygen concentration in the biogas.

**Keywords:** Methane fermentation, photobioreactor, carbon dioxide, CO<sub>2</sub> biosequestration, methane.