

ORGANICS (COD) REMOVAL IN DEPENDENCE ON LOADING  
OF VOLATILE FATTY ACIDS (VFA)  
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**Abstract:** The aim of the study was to estimate the influence of volatile fatty acids (VFA) loading on the contribution of the biomass growth, cell respiration, denitrification and poly- $\beta$ -hydroxybutyrate (PHB) accumulation involved in COD removal by activated sludge. Kinetics of PHB production, PHB and COD consumption were determined. Experimental series were carried out in sequencing batch reactor. The amount of air entering SBR was maintained at the stable set-point of 2 mg O<sub>2</sub>/L, oxygen depletion phase occurred in initial hours of the reaction time. SBR was fed with the mixture of municipal wastewater and supernatant from the digesters. Feast period of the external organic substrate availability (f<sub>1</sub>) and famine period of little organics availability (f<sub>2</sub>) were determined. With VFA loading (rVFA) increase from 0.029 to 0.052 g VFA/g VSS•d in the feast period, the effectiveness of COD removal depended on the use of organics for denitrification and internal PHB storage. PHB content in activated sludge increased from 0.2 to 0.35 Cmol/Cmol. In f<sub>1</sub> biomass growth and cell respiration in COD removal decreased from 21 to 14% and from 12 to 5%, respectively. In the famine period the remaining organics were removed due to biomass growth and cell respiration, denitrification and internal PHB storage was not observed.