Volatile fatty acids production by acidogenic fermentation of wastewater: a bibliometric analysis

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Table S1 shows the top-10 cited studies in the field of VFA and wastewater fermentation.

Table S1. The top-10 cited publications in the field of VFA and wastewater fermentation

Rank	Title – Authors	Journal	Year	Cites	C/Y*	Comments
1	Enhancement of waste activated sludge protein conversion and volatile fatty acids Accumulation during Waste Activated Sludge Anaerobic Fermentation by Carbohydrate Substrate Addition: The Effect of pH Leiyu Feng, Yinguang Chen and Xiong Zheng	Environmental Science and Technology	2009	298	24.8	The authors investigated the effect of pH on waste activated sludge protein conversion and VFA production by anaerobic fermentation after the addition of carbohydrates. The results showed that the addition of carbohydrates resulted in improved protein conversion. In addition, pH influenced both total VFA production and the percentage of individual VFA. Maximum VFA production (520.1 mg COD per gram of volatile suspended solids) occurred at a pH of 8.0 and a fermentation time of 8 days.
2	Production of polyhydroxyalkanoates by activated sludge treating a paper mill wastewater Simon Bengtsson, Alan Werker, Magnus Christensson and Thomas Welander	Bioresource Technology	2008	261	20.1	In this study, the production of PHA from activated sludge generated in the anaerobic treatment of wastewater from a paper industry was investigated. The authors carried out acidogenic fermentation to convert organic matter to VFA, enrichment of PHA-producing organisms and accumulation of PHA in batch experiments. Experimental results showed that 74% of the soluble COD was present as VFA (acetate, propionate, butyrate and valerate) and the resulting HAP after batch accumulation consisted of 31-47mol% hydroxybutyrate and 53-69mol% hydroxyvalerate.

Table S1. The top-10 cited publications in the field of VFA and wastewater fermentation (continued)

3	Biohydrogen production from cheese processing wastewater by anaerobic fermentation using mixed microbial communities Peilin Yang, Ruihong Zhang, Jeffery A. McGarvey and John R. Benemannd	International Journal of Hydrogen Energy	2007	185	13.2	The authors investigated batch and continuous anaerobic fermentation processes for H_2 production from cheese whey wastewater using mixed microbial cultures. In batch experiments, they verified H_2 yields of 8 and 10 mM/gCOD when the bioreactors were fed with feed-to-microorganism ratios of 1.0 and 1.5, respectively. A pH range of 4.0 to 5.0 favored continuous fermentation of the wastewater studied. The maximum H_2 production yields were observed when Lactobacillus bacteria predominated in the bioreactor.
4	Anaerobic acidogenesis of a complex wastewater: I. The influence of operational parameters on reactor performance Georgia Dinopoulou, Thomasine Rudd and John N. Lester	Biotechnology and Bioengineering	1988	180	5.5	The objective of the study was to investigate the effect of different operating parameters (hydraulic retention time, influent substrate concentration, organic loading rate, pH and temperature) on the conversion of the substrate (beef extract-based) into volatile acids, on the rate of acid production per unit reactor and on the composition of the reactor effluent. The degree of acidification increased with hydraulic retention time and decreased with influent substrate concentration and organic loading rate. An opposite behavior was verified for the rate of product formation. For all operational conditions, the predominant fermentation products were acetic and propionic acid.
5	Acidogenic fermentation of industrial wastewaters: Effects of chemostat retention time and pH on volatile fatty acids production Simon Bengtsson, Jakob Hallquist, Alan Werker and Thomas Welander	Biochemical Engineering Journal	2008	177	13.6	The objective of this study was to examine the acidogenic fermentation of four industrial wastewaters (three paper mill effluents and one whey effluent), as potential substrates for PHA production, through batch and continuous experiments. For the conditions applied in the batch (pH 6) and continuous (pH 3.5-6 and retention time 8-95 h) experiments, the main fermentation products were acetate, propionate and butyrate. Retention time and pH of the chemostat significantly affected the composition of VFA produced.

Table S1. The top-10 cited publications in the field of VFA and wastewater fermentation (continued)

6	Olive oil mill effluents as a feedstock for production of biodegradable polymers D. Dionisi, G. Carucci, M. Petrangeli Papini, C. Riccardi, M. Majone and F. Carrasco	Water Research	2005	167	10.4	The objective of the study was to examine the production of PHA from olive oil mill effluent. The authors investigated anaerobic fermentation without pretreatment, with different pretreatments (centrifugation, bentonite addition and bentonite addition followed by centrifugation), at different COD concentrations. Additionally, PHA production was investigated through batch experiments with a mixed culture of an aerobic SBR. The results showed that at all initial concentrations, pretreatment by centrifugation (with or without prior bentonite addition) significantly increased the final VFA concentration and yield, while bentonite addition alone had no influence. The initial specific rate of PHA production obtained from the fermented effluent was approximately 420 mg COD $gCOD^{-1}$ h^{-1}.
7	Biological hydrolysis and acidification of sludge under anaerobic conditions: The effect of sludge type and origin on the production and composition of volatile fatty acids Ahmed Suheyl Ucisik and Mogens Henze	Water Research	2008	156	12.0	The objective was to examine the efficiency of acid fermentation (VFA production and composition) with a short SRT in various types of sludge, through batch and semi-continuous experiments. The results showed that primary sludge fermentation produced higher amounts of VFA and generated significantly higher COD and VFA yields compared to other types of sludge. COD yields for primary, activated and mixed sludge were 19.1%, 6.5% and 21.37%, respectively, in semi-continuous experiments operated with a SRT of 5 days and a temperature of 37 ºC.

Table S1. The top-10 cited publications in the field of VFA and wastewater fermentation (continued)

8	Continuous fermentative hydrogen production from cheese whey wastewater under thermophilic anaerobic conditions Nuri Azbar, F. Tuba Çetinkaya Dokgöz, Tugba Keskin, Kemal S. Korkmaz and Hamid M. Syed	International Journal of Hydrogen Energy	2009	149	12.4	The objective of this study was to investigate continuous anaerobic fermentation processes for H_2 production from cheese whey under thermophilic conditions, varying TRH and OLR. The results showed a hydrogen content (5-82%) in the biogas and a hydrogen production rate ranging from 0.3 to 7.9 l H_2/l/day. The authors verified H_2 yields of 22, 15 and 5 mmol/g COD (at a constant influent COD of 40 g/l) with HRT values of 3.5, 2 and 1 day, respectively. In addition, H_2 yields of 3, 9 and 6 mmol/g COD, for OLR values of 47, 35 and 21 g COD/l/day (at a constant HRT in 1 day) were observed.
9	Microbial fuel cells operating on mixed fatty acids Stefano Freguia Ee Hoi The, Nico Boon, Kar Man Leung, Jurg Keller and Korneel Rabaey	Bioresource Technology	2010	141	12.8	The authors investigated the potential use of VFA mixtures from fermented sludge hydrolysates for power generation by microbial fuel cells. The results showed that acetate and propionate were preferred as electron donors in the mixed VFA system, generating a power density of 49±1 mW L^{-1} NAC. The other VFAs (butyrates/valerates/caproic acid) were also removed, although at a slower rate.
10	Enhanced hydrolysis and methane yield by applying microaeration pretreatment to the anaerobic co-digestion of brown water and food waste Jun Wei Lim and Jing-Yuan Wang	Waste Management	2013	141	17.6	The objective of the study was to investigate the effect of microaeration pretreatment on the degradation of brown water and food waste in batch tests. Additionally, the authors examined the influence of inoculum on the effects of microaeration. The results showed that microaeration is an effective pretreatment for anaerobic co-digestion of wastewater and food waste. In addition to increasing solubilization and acidification efficiency, microaeration enhanced the conversion of other short-chain fatty acids to acetate. In addition, the authors demonstrated that the nature of the inoculum influences the effect of microaeration. A 21% and 10% increase in methane yield was verified when pretreatment was applied to inoculated substrates and to substrates without inoculum, respectively.

* Citations per year