Effects of Benzalkonium Chloride, Proxel LV, P3 Hypochloran, Triton X-100 and DOWFAX 63N10 on anaerobic digestion processes - DTU Orbit (07/10/2019)

In this study, the individual and synergistic toxicity of the following xenobiotics: Benzalkonium Chloride (BKC), Proxel LV (PRX), P3 Hypochloran (HPC), Triton X-100 (TRX), and DOWFAX 63N10 (DWF), on anaerobic digestion (AD) process, was assessed. The experiments were performed in batch and continuous (up-flow anaerobic sludge blanket, UASB) reactors with biochemical-industrial wastewater, as substrate. In batch experiments, half-maximal inhibitory concentrations (IC50) for the tested xenobiotics were found to be 13.1, 1003, 311.5 and 24.3 mg L1 for BKC, PRX, DWF and TRX, respectively while HPC did not affect the AD process. Furthermore, the xenobiotics mixture tested did not present any synergistic inhibitory effect on the AD process. In continuous experiments, BKC and xenobiotics' mixture induced even stronger (more than 85%) of inhibition, expressed as IC50, compared to the levels observed from the batch reactors. Oppositely, TRX showed no inhibition in continuous mode, while inhibition was detected at batch mode.