Degradation of PCBs in sewage sludge during methane fermentation process concerning environmental management

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ABSTRACT

The aim of the investigation was degradation of polychlorinated biphenyls (PCBs) in sewage sludge and supernatants during the methane fermentation process. The mixture of municipal sewage sludge and industrial sewage sludge was incubated for 20 d at 37°C in the dark. The quantification of the PCBs was carried out simultaneously in both the solid and supernatant phases, the latter separated from the sludge during centrifugation. The prepared samples of sewage sludge and supernatants were subjected to extraction with the application of the organic solvents mixture. The qualitative–quantitative analysis of PCBs was done using the GC–MS system. After 20 d, the solid phase was observed to have its PCBs content reduced by 58% in the solid phase and 71% in supernatants. The percentage removal of PCBs was 49 and 75% in solid phase and in supernatants mixture of municipal and industrial sewage sludge, respectively.

Keywords: PCBs; GC–MS; Fermentation; Sewage sludge; Supernatants

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