

## Two-Stage UASB Process to Treat Purified terephthalic acid (PTA) Wastewater: Process Performance and Microbial Community Analysis

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Purified terephthalic acid (PTA) wastewater contains high concentrations of terephthalic, acetic, benzoic and p-toluic acids. This PTA wastewater has usually been treated by an anaerobic biological method, which can be accomplished by a syntrophic culture system. The involved syntrophic culture system is known to have a distinct feature that the activities of acidogenic microbes responsible for the degradations of benzoic, terephthalic and p-toluic acids are severely inhibited by acetic acid. In this study, we designed a two-stage UASB process as an efficient process configuration to be able to cope with the aforementioned feature of the syntrophic culture system and operated it using a synthetic PTA wastewater. It was found that all the major pollutants except p-toluic acid could be completely degraded in the first reactor and the remaining p-toluic acid could be removed in the second reactor. In the results of microbial community analysis, the outer surface of the granule obtained from the first reactor was mostly dominated by methanogenic archaea cells whereas that from the second reactor was dominated by acidogenic bacteria cells.