

International Conference on

MATERIALS AND POLYMER CHEMISTRY

July 05-06, 2018 Bangkok, Thailand

Anaerobic co-digestion of pig manure and food waste in combined two stage reactor and in membrane reactor

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A single reactor, namely a combined two stage reactor, was designed and tested in conducting the hydrolysis and acidogenesis, methanogenesis stages of anaerobic digestion process. To enhance the effluent quality, a membrane layer was inserted outwardly into the combined two stage reactor as a unique reactor, calling the membrane reactor. The symmetric dense cross-linked chitosan membrane from local manufacturer was used in the membrane reactor type. The methane production and wastewater treatment efficiencies in anaerobic co-digestion of pig manure and food waste were investigated. The ratios at 100:0, 90:10, 80:20, 70:30 and 0:100 with TS contents of 5%, 10% and 20% were experimented in both reactors for comparison. It was found that the membrane reactor provided better performance than the combined two stage reactor. The mixed waste showed better performances than using only the pure pig manure. The higher TS, the better performances were obtained. The methane portion and yield from membrane reactor at 70:30 and 20% TS were 59.6% and 1.57±0.12 L/d, respectively. The treatment efficiencies in term of COD, TS and VS removal were 87.5±0.9%, 47.1±1.3% and 49.7±1.9%, respectively.

Biography

Khanthong Soontarapa has her expertise in membrane technology and chemical safety. She is currently an Associate Professor in Department of Chemical Technology, Faculty of Science, Chulalongkorn University, Thailand. She is interested especially in chitosan membrane application for water and wastewater treatment, pervaporation, gas separation membrane, fuel cell membrane and development for health and biomedical applications.

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