

The Potentials of an Integrated Ultrasonic Membrane Anaerobic System, IUMAS for POME Treatment

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1. INTRODUCTION / ABSTRACT / BACKGROUND

With the increasing energy crisis and the drive to reduce CO₂ emissions, universities and industries are challenged to find new technologies in order to reduce energy consumption, to meet legal requirements on emissions, and for cost reduction and increased quality. The direct discharge of Palm Oil Mill Effluent, POME wastewater causes serious environmental pollution due to its high chemical oxygen demand (COD), Total suspended solids (TSS) and biochemical oxygen demand (BOD). Traditional ways for POME wastewater treatment have both economical and environmental disadvantages. In this study, ultrasonic assisted-membrane anaerobic system (UMAS) was used as an alternative, cost effective method for treating POME wastewater (to avoid membrane fouling).

3. NOVELTY / INVENTIVENESS / METHODOLOGY

- Design of UMAS for wastewater treatment and retain CH₄
- Avoid fouling of membrane via intermittent ultrasonic application
- The plant size can be reduced, e.g. from 50 X 20 m to 10

5. MARKETABILITY / COMMERCIALIZATION / POTENTIAL MARKET

- The system is an alternative and cost effective to the current wastewater treatment systems.
- The system has partners from Japan (ENTRON CO. LTD, Japan).
- It is a renewable and green technology.
- The system is ready for commercialization.

7. ACHIEVEMENTS / ENVIRONMENTAL IMPACT

- UMP Pre-commercialization grant, UIC120301, RM 60,000.00
- FRGS, RDU130113, RM125,500.00
- FRGS, RDU140133, RM119,400.00

9. Data Collection



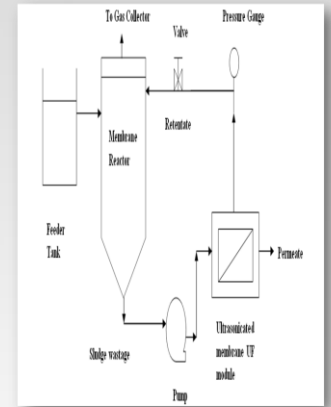
2. COLLABORATORS

- The system has approached by Japan (ENTRON CO. LTD, Japan).
- It is a renewable and green technology.
- The system is ready for commercialization

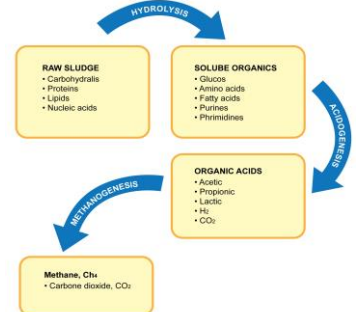
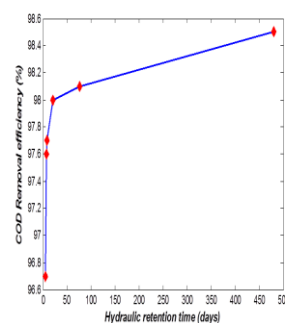
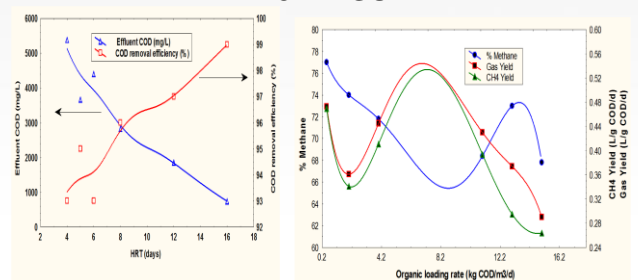
4. BENEFITS

- ❖ Reduce the retention time from 60 days to 28 days
- ❖ Avoid fouling of membrane via intermittent ultrasonic application
- ❖ Reduce COD removal further to 96 %
- ❖ Low cost compared to the conventional methods
- ❖ Captured CH₄ over CO₂
- ❖ Material of construction- no restriction since it operated at pH 6.8-7.8

6. MATERIALS



8. RESULT



10. PATENT /COPYRIGHT

Patent NO: MY-162725 – A (Granted patent)

Patent NO: PI: 2011000192

Patent NO: PI: 2011005789