**Biohydrogen production from microwave pretreated mixed inoculum using kitchen waste by anaerobic digestion in batch reactors**

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**Abstract:**

Pretreatment of the mixed inoculum i.e. cow dung was performed to observe the enhancement of the biohydrogen production in anaerobic fermentation process. In this study the Microwave irradiation was exposed to the mixed inoculum for four different timing 0.5 min, 1 min, 1.5min and 2 min. along with the normal reactor (Without microwave irradiation) at the power output of 800W and the frequency of 2400MHz. 20% of the mixed inoculum was exposed for the microwave pretreatment with working volume 800 ml of the batch reactor. Maximum biohydrogen production was observed in the 1 min. microwave pretreated inoculum batch reactor with value of 78.9% in total gas. Maximum cumulative biohydrogen production and biohydrogen production rate were 132.47 ml H2 L-1 and 0.193 mmol H2 L-1 day-1was observed respectively in the 1 min. microwave inoculum pretreated batch reactor. During the fermentation process Volatile fatty acid also formed. The highest acetate concentration of 2354.2 mg L-1 was observed in the 1min. microwave inoculum pretreated batch reactor and butyrate concentration 2385.9 mg L-1 was observed in the same reactor. The HAc/ HBu ratio was found maximum in 1 min. MW pretreated batch reactor with value of 1.04 which shows that the maximum hydrogen production was formed in this reactor.

**Keywords:** Mixed Inoculum, Microwave irradiation, biohydrogen, VFA