Waste to energy generation from distillery waste water

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Molasses based distilleries are classified as "Red Category" because of the large volume of high strength waste water generated by them. Pollution caused by spent wash is one of the most critical environmental issues. Spent wash is one of the recalcitrant waste having extremely high COD (120000 mg/l), BOD (60000 mg/l), SS, inorganic solids, low pH, strong odour and dark brown colour. The problem of increasing amount of spent wash generation and stringent norms has resulted in development of new technologies for its effective and economical disposal.

Biomethanation is viewed as a complex ecosystem in which physiologically diverse groups of micro-organisms operate and interact with each other in a symbiotic, synergistic, competitive and antagonistic association. The anaerobic microbial food chain consists of mainly three functionally different groups of microorganisms. Following four pathways are involved in anaerobic digestion of organic wastes

• Hydrolysis: Hydrolysis break down macro organic materials such as carbohydrates, proteins and lipids, by incising water molecules into lower molecular weight fatty acids, amino acids and sugars.

• Acidogenesis: Acidogenic bacteria convert fatty acids, amino acids and sugars into organic acids, hydrogen, ammonia and carbon dioxide.

• Acetogenesis: Acetogenic bacteria convert organic acids, hydrogen and carbon dioxide into acetic acid, hydrogen and carbon dioxide.

• Methanogenesis: Methanogenic bacteria convert acetic acid, hydrogen and carbon dioxide into methane and carbon dioxide. Readily available CO_2 is used as an electron accepter. This reaction is slowest and the rate limiting step of the total anaerobic digestion process.

Generated methane gas is used as a fuel and cost saving by using methane in boiler or it is possible to make bottling of gas

Speaker Biography

Rajendra S Raut is a faculty member of Department of Chemical Engineering, AISSMS College of Engineering, India. He earned a Bachelor of Chemical Engineering (2000), a Master of Engineering from Institute of Chemical Technology, Mumbai. He has total 16 years of working experience in Chemical Engineering filed. For the past 6 years, Rajendra has taught various Chemical Engineering subjects for PG and UG in AISSMS College. His interests include: Energy Saving in plants, Energy Conservation, Heat Transfer; Mass Transfer, Alcohol and incorporation of technical innovative ideas within his classroom. He is a member of the organization "Indian Institute of Chemical Engineers".

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