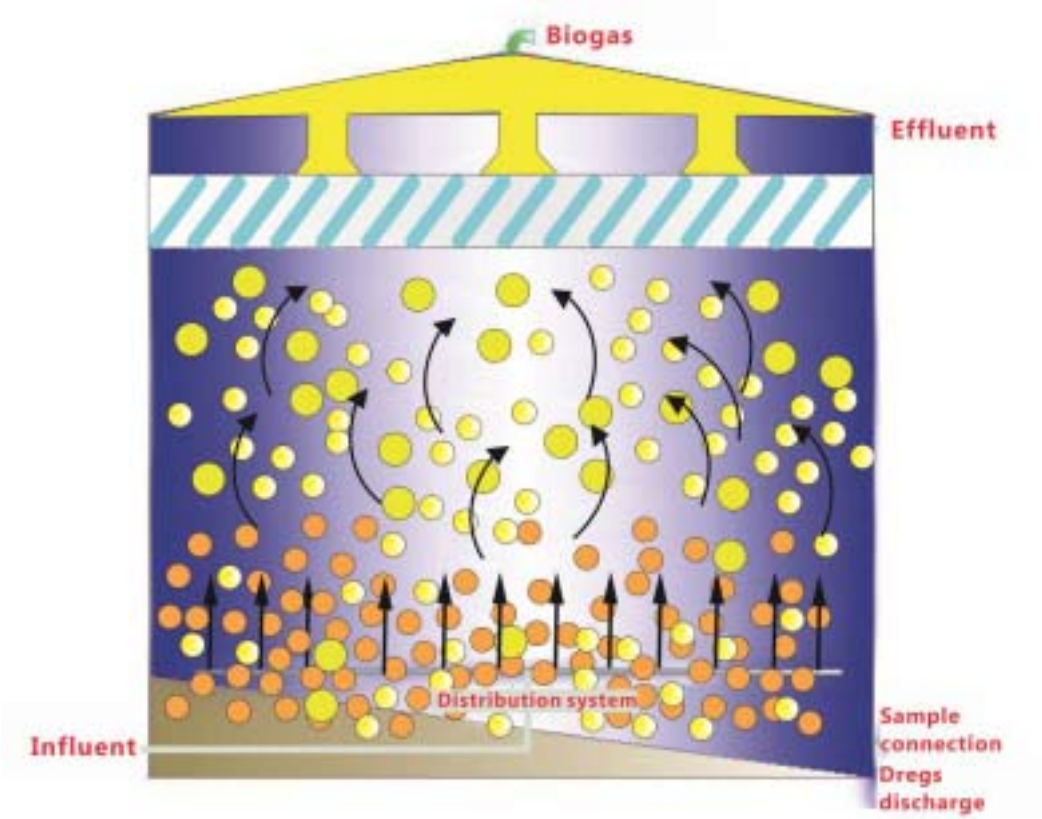
全混式厌氧反应器(BSAR)

全混式厌氧反应器（Blend-stirred Anaerobic Reactor-BSAR），是加拿大查韦高科针对高温度、高有机物含量和高悬浮物废水（简称“三高”废水）的处理，开发出利用“三高”废水产生沼气，变废为宝的新一代高效厌氧反应器。BSAR已经成功应用在多项工程实践上。

Blend-stirred Anaerobic Reactor (BSAR), introduced by Tri-Y Technologies Inc. (Canada), is a new generation of highly effective anaerobic reactor designed for treatment of waste water with high temperature, high organic loads and high suspended solids (as called the “three high” waste water), which turns the water into valuable treasures: biogas. Now the BSAR system has been successfully applied in several projects.

1. 原理/Principle



BSAR主要由进水配水系统、污泥反应区、气/固液分离系统、排渣系统等组成。废水由反应器底部的配水系统均匀布水进入污泥反应区，污泥反应区始终保持膨胀状态，强化厌氧菌与有机物的传质效果，使厌氧反应充分，提高产气效率；气/液分离区实现沼气与泥水分离并收集至沼气稳压柜作为能源利用，反应器出水液面设置固液分离装置，将泥水分离，降低出水的SS含量；渣及污泥则通过污泥排渣系统均有排出。

BSAR is mainly composed of a water distribution system, sludge reactor, separation system for gas/solid and liquid, and a drainage system. After waste water is evenly delivered into the sludge-reacting section by the distribution system at the bottom of the reactor, the sludge reactor constantly maintains its expansion for strengthening mass transfer between anaerobic bacteria and organic matters until anaerobic reaction has fully processed, which can boost the gas production. Then the separation system separates the biogas and muddy water and collects them with biogas regulators for energy utilization. And a solid-liquid separation device is installed at the surface of water outlet of the reactor, which separates the sludge and water so that the SS volume of the water can be lowered. At the end, the residues and sludge are disposed by the drainage system.

对于“三高”废水处理，BSAR克服了传统厌氧技术的不足，充分利用废水中的热量，在较高温度（55 左右）条件下，厌氧污泥活性高，COD去除效率可达到85%以上，极大拓宽了厌氧技术的应用领域。废水经过预处理后泵入BSAR厌氧反应器，绝大部分有机质在反应器中厌氧微生物的作用下得到降解并转化为生物质能源—沼气，每千克COD可产沼气量达0.4-0.5m^3。

In order to conquer the deficiencies of traditional anaerobic technology for the “three high” waste water, BSAR maintains the temperature of waste water over 55^oC to preserve the high reactivity of the anaerobic mud, hence, the efficiency of COD removal can reach over 85%, which means the application of the anaerobic technology will be widely expanded. After the waste water is pretreated and pumped into the BSAR anaerobic reactor, the majority of the organic matters can be degraded and turned to bio-energy - biogas by the anaerobia in the reactor at a rate of 0.4-0.5m^3 per kilo of COD.

2. 技术特点/Technical Features

- 甲烷转化率高，沼气产量大、纯度高

  High conversion rate for biogas with high production and purity;
- 抗负荷冲击能力强

  High loading resistance against the “three high” waste water;
- 厌氧污泥活性好、处理效率高、容积负荷达5-10kgCOD/m^3·d

  High reactivity of the anaerobic mud, effective treating process and 5-10kg COD/m^3·d of loading capacity;
- 布水均匀、搅拌充分、反应区内无死角

  Uniformly distributed and fully mixed, no blind angle in the reactor
- 污泥流出量少、出水SS低

  Low discharge of mud and SS volume
- 工艺流程简单、操作运行方便

  Simple process and easy operation
- 投资省、运行成本低

  Low operation cost and investment

3. 应用领域/Application

- 酒精废液处理

  Alcohol waste water treatment
- 淀粉废水处理

  Starch waste water treatment
- 酵母废水处理

  Yeast wastewater treatment
- 养殖废水处理

  Aquacultural wastewater treatment

4. 工程业绩

- GreenField Ethanol, Boucherville, Quebec, Canada

- BioEnergy Group, Jardins Merici, Quebec, Canada
- Starch Operating Inc, Etobicoke, Canada
- Permolex, Red Deer, Alberta, Canada

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