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MBBR–A Convenient Option for Waste Water Treatment

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Abstract: **-- The MBBR is a promising technology in the advancement of wastewater treatment. The paper consists of the brief description of various units that had been used in MBBR technology. These paper help to identify the possibility to use MBBR as an ideal & appropriate process for the treatment of wastewater. The conclusion includes comparative study by various researchers with the remark, that MBBR by using microbiological chips which acts as a floating media has a great potential in removing various harmful characteristics of wastewater.**

Keywords**: - MBBR , HDPE, Floating media, Microbiological chips.**

I. INTRODUCTION

The MBBR is highly effective biological treatment process for waste water treatment. It was developed in Norway at norweign University of science and technology in co-operation with Norweign company kaldnes miljoteknologi. There are more than 600 installation worldwide in both the municipal and industrial sector with about 36 in North America. Recently, Moving Bed Biofilm Reactor (MBBR) has brought increasing research interest in practice for removal of biodegradable organic matter and its application which has undergone various types of modification and development.

The MBBR uses the floating media i.e. MBC with HDPE which helps to create a larger surface area for growth of micro-organism by creating a biofilm. A biofilm is a well-organized and co-operating community of micro-organism, biofilm can be formed on all types of a surfaces such as plastic, metal, glass and oil particles. Biofilm occurs step by step:-

1. Formation of condition layer
2. Bacterial growth
3. Biofilm expansion.

Moving Bed technology is one of the capable technologies used for treatment of wastewater. The MBBR provides benefits provided by both fixed film and suspended growth processes. The types of moving bed is given in Fig.1. The MBBR is reliable, innovative and cost effective treatment process for the waste water treatment.

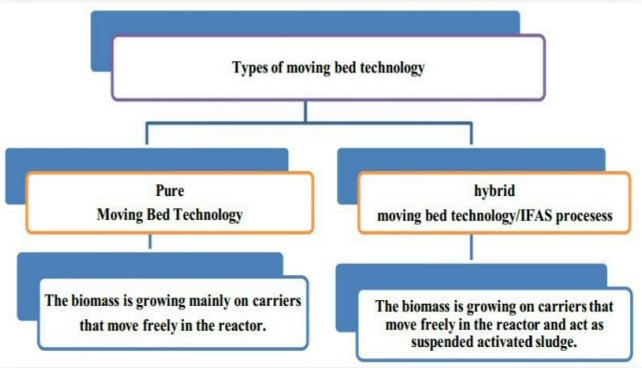

Fig no.1 Types of Moving Bed Technology

The detail study was done in previous 30years. Many investigators researches on this terminology. MBBR Unit Consists of several important parameters which are responsible for its waste water treatment process. These parameters are discussed below.

BOD

I. khedikar (2017) proved that the lack of oxygen leads to the decrease in the removal efficiency. The BOD removal efficiencies under constant aeration flow rate for the retention time of 24 hours and 48 hours is seen up to 86% and 90% respectively. Prachi N. Makode (2014) explained that the average BOD at inlet is 134.63 mg/lit with maximum of 151mg/lt and minimum of 113 mg/lt respectively. After the advance treatment, average BOD at outlet was observed to be 5.36mg/lt. maximum BOD at

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effluent is 7mg/lt. effluent BOD is within standard limits of discharging in the creek.

COD

Akbar mokhtari Agar (2001) explained that, in order to be able to reuse the treated waste water the dissolved oils, hydrocarbon and other constituents that amount to the COD level must be removed. Iran .J. Emission (2008) stated that the average effluent soluble COD concentration from each reactor showed the de nitrification process in the anoxic reactor consumed most of the bio degradable organic matter. Odegard (2009) concluded that the 2 hours is the beneficial effective retention time for pollutant removal. But for the complete removal of BOD and COD the HRT value is to be increased.

DENITRIFICATION

MBBR denitrification processes are commonly used in decentralized wastewater treatment systems for their ease of operation and elimination of bulking problems.

Rauhallah Mahmoudkhani (2012) stated that denitrification rate has increased with increasing NO3 – N loading in filtration and the maximum denitrification rate was occurred. A.Jafarzaeh (2010) showed that the partial denitrification process in the moving bed bio reactors system has an acceptable performance for treatment of waste water with high load of organic carbon and organic nitrogen compounds.

BIOMASS

J.Mautin-Pascual (2011) consider two carrier for his study and made the comparison between both carrier elements. He observed that biomass always had a higher density, geometric porosity, and a larger boundary fractal dimemension than flocs.

COMPARATIVE ANALYSIS

MBBR is an effective technology for the water treatment and for BOD/COD removal. Conventional Activated sludge system has been extensively used in waste water treatment since decade. In the study given by Lariyan Mohd Sidek (2015), comparison of MBBR and CAS system has been discussed. It was found that MBBR has higher COD(58%) TSS(80%) removal rate compared to CAS which has COD (53%) TSS (69%). For BOD removal rate CAS shows 68% removal rate where MBBR shows 65%. In terms of sludge production MBBR sludge is less than CAS . MBBR was found to have better rate of constituent removal efficiency compared to CAS.

II. CONCLUSION

Today the need for clean water is rapidly increasing. So MBBR technology is promising technology and widely used in the world for treating different kinds of effluents under different conditions.This study may be helpful to check possibility that the moving bed biofilm process can used as an ideal and efficient option for the total nutrient removal from municipal wastewater. The mode of change of aeration provided during the experimental work may affect the efficiency of waste water treatment to good extent. The Moving Bed technology may help to check the feasibility of waste water treatment by using both attached growth system and suspended growth system combinely which cannot be done with the conventional treatment process. This technology may be conducted to get low concentration of solids leaving the biological reactors, the absence of filamentous bulking and good settling characteristics of the sludge. The change in the type of media carriers during the experimental work may help to get the expected results in a very beneficial manner as compare to conventional activated sludge process. Looking towards the present scenario, MBBR found to be a very valuable technology which can be used for small scale and even in large scale treatment of waste water.

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