

Applied Study of Ecological Fibre and Ceramic Padding for Micro-polluted Water Treatment

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Abstract The ecological fibre is a new water treatment material that is processed by simulating the shape of wild water plant. In recent years it has been applied broadly in sewerage treatment for its following advantages: big specific surface area, high capacity in removing organic matter, good microbiological adhesiveness, variable pore sizes, wonderful performance in preventing jamming, flexibility in operation and management, etc. Ceramic padding has high porosity and moderate density, all of these are favorable to the growth of microorganisms. This paper discussed treating the micro-polluted water by using arts and crafts of constructed wetland, the results show that some indexes of the treated water reached or exceeded band 3 national water quality standard, these indexes include CODCr, TP, TN and NH₄⁺-N and so on. The results can provide reference for project design.

Key words: ecological fibre, ceramic padding, micro-polluted water, wild water plant

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1 Introduction

The ecological elastic padding and ceramic are new materials for water treatment. Simulating wild water plant using aldehyde fibre as basic material produced the ecological elastic padding. In recent years, it was applied broadly in sewerage treatment^[1]. The surface of ceramic is rough and irregular, with a lot of holes on its surface, the diameter of these holes is about 0.5 μm while that of bacteria is about 0.5 ~ 1.0 μm, so this structure of ceramic are beneficial for

microorganism growth^[2].

2 Material of experiment

- 2.1 Water of experiment
- The lake that experiment water comes from lies in front of the base experimentation of Qianwei ecological village. Now, the water quality is equal to grade V or worse than grade V.
- 2.2 Parameter of ecological padding
- The parameters of padding are shown in table 1.

Tab 1 Parameters of padding

Ecological elastic padding				Ceramic padding		
Diameter of padding (mm)	Diameter of padding thread (mm)	Diameter of centric line (mm)	Amount of per meter padding thread (strip)	Exterior acreage of per meter padding thread (sq m)	Relax weight (kg/m ³)	Wash intensity (MPa)
200	0.5	3.5	2000	0.5	600 ~ 900	3.0

2.3 Small experimental device

The small experimental device includes two sets. The device appears in Fig 1 and Fig 2.

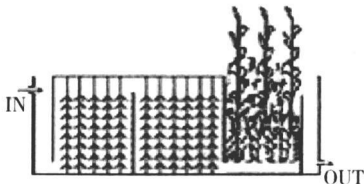


Fig 1 Device of undercurrent

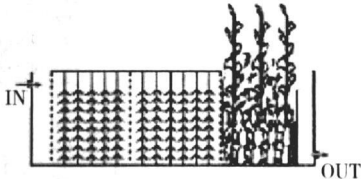


Fig 2 Device of subsurface flow

3 Results and analysis

3.1 Variety of water quality

The bio film was packed on padding naturally after about two weeks that the brown microbiological film appears on elastic thread. The bio film near influent is about 2 mm in depth and 0.5 mm near out fluent. The results of water quality when in packing bio film are shown in Fig 3 and Fig 4.

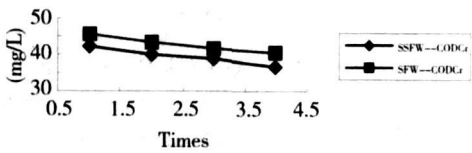


Fig 3 The effect of CODCr removal

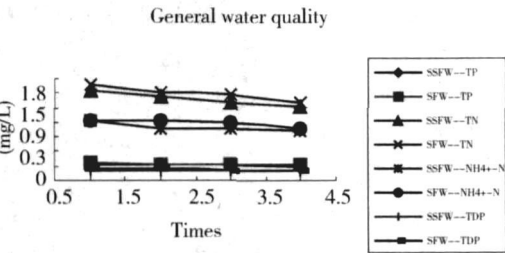


Fig 4 General water quality

The granules N and P can be removed by adsorbing of padding thread. microorganism on padding thread can wipe off the TDN and TDP. Because the generation periods of autotrophy nitrification bacteria is long, NH_4^+-N is low in bio-film packing period, so the accumulate of nitrification bacteria is slow^[3-5]. The results appear in Fig 5 and Fig 6.

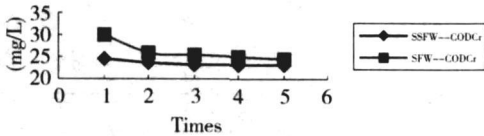


Fig 5 The effect of get rid of CODCr

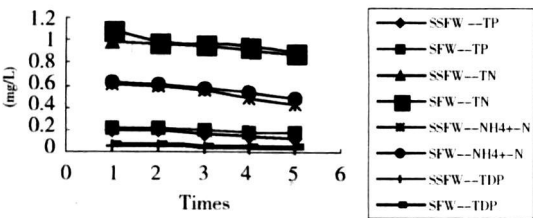


Fig 6 General water quality

3.2 Treatment effect of turbidity

There are two factors that help ceramic padding reduce the turbidity. One is that the 2~5mm padding was compressed and

can filtrate the biggish suspended matter, the other is that the microorganism living on the surface of ceramic can cut some colloidal matter by their biological flocculation function then reduced the Zeta degree and be propitious to agglomeration of colloid grain in water^[6-7].

4 Conclusion

- By three months' test, the following results are concluded:
- (1) The Purification effect of elastic padding in treating seriously polluted water is quite good. the microorganism can adhere to elastic thread well and SS can be wiped off, so the water looks more clear.
 - (2) The elastic padding has smooth surface, it's propitious to regeneration of biological film and microorganisms.
 - (3) The ceramic padding is propitious to the growth of microorganisms and the removal of turbidity.

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生态弹性填料及陶粒在微污染水体处理中的应用研究

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摘 要：生态弹性填料是一种模拟天然水草形态加工而成的新型水处理材料，近年来在污水处理中得到了广泛应用。其具有比表面积大、去除有机物容积负荷高、生物附着性好、空隙可变、不易堵塞、适应性强、操作管理简便等优点；陶粒具有较高的孔隙率及适中的密度，所有这些都有利于微生物的生长。本文采用人工湿地作为构筑物对崇明前卫生态村中心湖的水体进行处理，结果表明，经此工艺处理后的水体，COD_C、TP、TN、氨氮等指标达到或优于国家三类水质标准。并为工程实施提供了科学依据。

关键词：生态弹性填料；陶粒；微污染水体；天然水草

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一种高效的强酸性镀锡废液回收处理新工艺

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摘 要：阐述了一种未见报道的能对强酸性镀锡废液进行大规模集中回收处理的新工艺。这套工艺是在对废水进行预热的条件下，利用硫酸钠和聚丙烯酰胺作为聚沉剂和絮凝剂，便可在短时间内对大量的强酸性废液进行高效处理，最后经过压滤便可得含锡量高的锡泥。

关键词：镀锡废液；硫酸钠；聚丙烯酰胺；絮凝剂

中图分类号：X703.1