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循环式生物滤池处理城市地表径流的性能研究

Performance evaluation of recycling bio-filter in the treatment of urban runoff

关键词: [塔式生物滤池](#) [城市地表径流](#) [循环](#) [木片](#)

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摘要: 对以木片为填料的塔式生物滤池配置循环装置,将其应用于处理城市地表径流污染.通过设置不同的循环次数,比较了循环操作对滤池性能的影响.研究表明:该循环式生物滤池在处理径流过程中存在适应驯化期,不同的污染物质其适应驯化时间不同.COD所需驯化时间最长,适应期内总入水水量达到装置空隙体积的8.5倍; NO_3^- -N和TP适应期相当,总入水水量约为空隙体积的7.2倍;TSS与TN所需的时间最短,总入水水量约为空隙体积的5.3倍.该循环式生物滤池对TSS、COD、 NH_4^+ -N、 NO_3^- -N、TN和TP的平均去除效率分别为86.2%、24.3%、11.1%、85.9%、37.7%和45.7%.循环操作对生物滤池的性能影响研究表明,TSS、 NH_4^+ -N与TP的去除随循环次数的增加而增加,TN与 NO_3^- -N的去除未明显影响.由于循环过程中部分有机质从木片中析出,使得有机物质(COD)的去除随循环次数的增加而降低.

Abstract: Recycling device-modified bio-filter filled with woodchip was used to dispose urban runoff. The recycling number was set as 2, 4 and 8. The effect of recycling on the treatment performance was compared based on the monitoring and experiments. Results indicated that there was a maturation or acclimation phase as usually observed in a filter and biofilm process, and the acclimation duration was different with different pollutants. During the period of the acclimation, the total inflow volume was about 8.5 times the porosity volume for chemical oxygen demand;the corresponding values were 7.2 for nitrate and total phosphorus, and 5.3 for total suspended solids and total nitrogen. The modified bio-filter can remove total suspended solids and nitrate effectively with efficiencies higher than 90%. However, it showed a lower treatment for organics removal, with the average efficiency around 30%. In terms of the effect of recycling, it contributed to the improvement of total suspended solids, ammonia and total phosphorus treatment, while showed little effect on the removal of total nitrogen and nitrate and decreased the chemical oxygen demand removal due to the release of organics during the recycling process.

Key words: [bio-filter](#) [urban runoff](#) [recycling](#) [woodchip](#)

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